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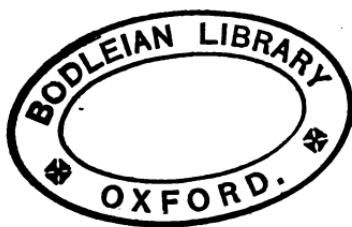
**A HANDY MEDICAL GUIDE FOR EVERY
MAN WHO OWNS A HORSE**

BY
GEORGE S. HEATLEY

VETERINARY SURGEON

**WILLIAM BLACKWOOD AND SONS
EDINBURGH AND LONDON
MDCCCLXXXII**

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Dedicated to

THE RIGHT HONOURABLE LORD REAY

AS A TRIBUTE OF RESPECT
AND SINCERE ADMIRATION OF
HIS MANY PHILANTHROPIC EFFORTS
DIRECTED TOWARDS THE DIFFUSION OF SCIENCE,
AND THE WELLBEING OF THE COMMUNITY,
BY HIS LORDSHIP'S
HUMBLE AND OBEDIENT SERVANT
THE AUTHOR.

P R E F A C E.

IN presenting this work to the public, the Author trusts that the subjects discussed will be found of considerable importance to those who take an interest in, and are connected with, the management of the Horse. It has been solely undertaken with a view to alleviate, mitigate, soothe, prevent, and cure some of the most important diseases incidental to that animal ; and the writer feels assured that, should the matters treated of receive the attention which they deserve, our obedient and willing servant will be saved much of that torture which is frequently unintentionally inflicted upon him. Actuated with such a desire—namely, the extension of help to the helpless—the Author earnestly hopes that this work will be welcomed by all lovers of the lower animals.

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THE
HORSE-OWNERS' SAFEGUARD.

PART I.

L A M E N E S S.

Introduction.

LAMENESS being a subject of such paramount importance, it will perhaps be beneficial to the reader as well as to the sufferer to consider the diseases under this heading first.

Lameness, to define it, means a manifestation of pain in one or more limbs during the act of progression. It is not necessary in some cases to walk the animal in order to detect it, and in other cases it entirely disappears when the animal has proceeded a short distance. With certain exceptions, lameness is discovered and diagnosed during the act of progression; and as a warning to purchasers, it may not be out of place to state here the

A

mode by which the buyer is sometimes "sold." In making such a statement, do not let it be supposed for one moment that I allude to all horse-dealers: that is as far removed from my thoughts as it possibly can be. But in speaking of this practice, which is rightly detested by honest men of substantial standing in the trade, it is nevertheless true that the degraded class will not hesitate or scruple to place in your hands an animal which they positively assert is thoroughly sound in every respect, and yet is not so. Take, as an illustration, a case which not unfrequently has brought men of my own profession into an unpleasant position. Say that a horse is suffering from bone-spavin, or rather the spavin is just commencing. Professional men know that, during the first stages of this disease, the lameness entirely disappears when the animal has been exercised for a short time; but allow such an animal perfect repose in the stable for an hour, and you will, upon your next examination, discover the lameness ere he has left the stall. Now, in cases such as this, the plan adopted by the unscrupulous dealer is the following: He keeps the horse in the stable at your request, while his attendant remains there also, as he has an important duty to perform. Therefore, while you are engaged with the dealer, the attendant, furnished with a stick, "which is inevitable," keeps the animal in constant motion, by urging him from side to side in the stall. Thus unitedly

they succeed in defying you to detect anything wrong. The result is that on the following day, if you should purchase, you discover when too late the nature of the imposition.

Lameness, until quite recently, has been entirely ignored by the Society for the Prevention of Cruelty to Animals. Still, unhappily, there exist numerous cases of torture, which ought to excite the sympathy of the humane, and stimulate them to renewed energy and vigilance, by giving such information "either to the Society or the police," as shall lead to the punishment such cruelty merits.

In those who are partly indifferent to the well-being of our domestic animals, lameness has not excited a passing thought. Others, again, simply look upon the inconvenience it causes to themselves, and too frequently, alas! apply punishments to the already tortured animal, coupled with epithets that cannot receive admission. How many owners of horses are there who mourn over a lame one and deplore its wretched condition, simply because it looks bad! How many are annoyed because they are afraid of the after consequences or sequel attendant upon lameness! while few, I believe, consider the cases sympathetically, and therefore are careless or indifferent whether the animal is suffering or not. If, then, it is impossible to penetrate even the covering of such a callous petrified nature, dead to sympathy and its accompanying demands,

let me endeavour to claim your attention through the pecuniary advantages that are to be gained by timely aid and treatment.

Lameness may be divided into two classes—namely, *acute* and *chronic*—and the treatment for either of these ought to be energetic; for we have an inflammatory process going on, which must either be arrested at once, or hastened to its termination.

The reader, I daresay, will be astonished at such a statement as this, and inquire with reason, Why this diversity of treatment? why speak in the same sentence of arresting and urging to its termination that inflammatory process? The answer is, that it greatly depends upon the structure that is infected with the disease. For example, in bone-spavin, and diseases affecting bones generally, including the coverings immediately attached, it is invariably a waste of time in attempting to arrest inflammation, as it has to run a prescribed course before the cessation of pain can be accomplished; or, in other words, the covering membrane has to become, through this inflammatory process, completely ossified and converted into bone, ere the disease can be said to have terminated,—so that in such cases the inflammation must be encouraged and hastened to its final limit. Again, when we have lameness as the result of accidents, injuries, sprains, &c., the treatment must be guided in the direction to arrest without delay the inflammation. Thus, by the distinction of the forms

and the structure involved, must the remedies applied be regulated and enforced.

Navicular Disease or Grogginess.

We will now proceed to consider navicular disease or grogginess, or inflammation of the navicular bone. Although this subject has received a considerable amount of study and research, are we to rest satisfied with the discoveries already obtained, without exerting ourselves still more to arrest and prevent this painful malady? Surely we ought to be encouraged and stimulated to renewed exertion, and to search assiduously for the best means. Let them be applied in order to grapple and encounter one of the most insidious ailments that falls to the lot of the horse.

Now, in order to combat this destructive disease, our efforts must be directed to the fountain-head—namely, *breeding, shoeing, and management*. If care were taken to avoid hereditary predisposition, the abolition of the drawing-knife in shoeing, and judicious attention paid to the feet, navicular disease would soon be exterminated. These, then, allow me to repeat, are the three primary causes which favour and establish its development,—breeding, shoeing, and management.

The practice of breeding with animals suffering from chronic navicular diseases cannot be too widely condemned. In fact, I have known instances occur-

ring under my own observation where animals were kept solely for this purpose, on the plea that the progeny realised a considerable sum, and were a profitable addition to the returns. Such animals are usually sold when young and unbroken,—so that when they have reached maturity, and the remaining exciting causes are brought into operation, we soon witness the effect.

We come now to consider the characteristic symptoms, which are separated from other signs, and are distinguished in the following manner:—

First, in all cases that appear suddenly, we find that sprain of the tendon is the cause. Narrow feet with straight pasterns are also very susceptible to it, and in cases where the toe has grown so long that the tendon is torn from its insertion to the bone during progression. But the most common form of this disease is the slow deceitful one. The animal begins to evince a peculiar uneasiness by pointing; for during this stage some structural change is taking place in the cancellated tissue, and if you examine the feet carefully you will find an increased heat around the top of the hoof,—in fact, the whole external surface of the hoof affected possesses this augmented temperature, which will be absent in the other. On turning him round in the stall, you will observe the slightest perceptible limp or drop upon the sound limb. He seems to stumble, but immediately gathers himself together ere he has

reached the stable-door, and when once out he finds other objects to attract his attention. So the lameness disappears—your conclusion being that your own senses have entrapped you. However, such is not the case; for once the foregoing symptoms are manifested, rest assured that the disease is working its way very slowly, but none the less surely, and that ere long you will discover it firmly established.

Now the great difficulty that has to be encountered is the remedy. While other diseases yield to treatment, this one frequently baffles all the best efforts that are made to arrest it; so that to be successful we must resort to and rigidly enforce the preventive measures.

At such a stage as the one described, where you detect the pointing accompanied with the limp, it is hopeless to continue working the animal, on the assumption that the lameness is transitory, and will wear off with exercise; for should your reason guide you to persevere in such a practice, every day will increase the obstacles, until eventually your horse becomes chronically incurable.

Treatment.—Having satisfied yourself that there is an absence of all other signs,—that there is neither a bruise, sprain, splint, side-bone, ring-bone, prick, nor other injury, and that the patient improves with exercise—(you may, or you may not, have a contracted foot: if you have, the evidence will sub-

stantiate your verdict at once),—then you have just reason to suspect navicular disease. The shoes must now be removed, the patient placed in a loose-box, and cold bran-poultices applied to the feet constantly. Do not allow the poultices to become dry or warm,—if you do, the heat counteracts the effect of the cold, and thus frustrates your efforts ; for by the constant application of cold water, you constringe, contract, and diminish the calibre of the vessels supplying the foot with blood, hence you reduce and retard the flow considerably. On the other hand, if you employ hot agents, you dilate, expand, assist, and encourage an extra supply, an increased flow, and a determination of blood to the already inflamed part. Now as this part is situated and confined within the horny box or hoof, the supply must be reduced, which can only be effected by the strictest attention being paid to the cold-water principle. This must be continued for at least a fortnight, and it will be advantageous to have the floor of the box covered with cool puddled clay several inches deep. Should the cold water fail to effect a cure, the patient must be blistered smartly round the coronet of both feet. The reason I recommend blistering the sound foot is, because it compels the animal to bear an equal weight upon them ; whereas, if one only is blistered, the whole pressure is thrown upon the sound limb, which often produces lameness unexpectedly, and is exceedingly annoying, more

especially when you reflect that it might have been avoided.

Setons are sometimes inserted through the solar part of the foot, and in such a case it would be necessary to seek professional aid.

The final remedy for this disease is one that we can rely upon with certainty, but it is attended with serious objections, which ought to be well considered before you determine its application,—I mean neurotomy, or the operation by which the nerves supplying the foot are divided. These nerves are separated between the knee and the fetlock-joint, and once this telegraphic communication betwixt the brain and the foot is cut, all feeling is removed; in other words, the animal is wholly insensible to pain, although the disease remains unalterable. Therefore you may have a puncture right into the sensitive part, or you may have a fractured bone through accident. A ruptured tendon, or canker, or cancer, may take place, and the only intimation you receive of anything being wrong will be the discovery of the hoof sloughing off entirely, when, of course, the animal is past recovery, and ought to be destroyed; so that, from a humane point of view, you prevent untold torture being inflicted by having the operation performed. Yet, by doing so, you are deceiving the public, should the animal be exposed for sale; while the risks I have enumerated may ultimately prove its destruction, and land you into litigation and

grief. Therefore you will perceive the necessity of directing your energy to the means of prevention more especially applicable to this form of lameness.

Avoid breeding from animals with narrow contracted feet; allow the frog to descend to the ground, and on no consideration whatever permit it to be pared and reduced. This frog has its functions to perform: it is placed there by nature as a special protection to this navicular bone; and being composed of elastic tissue, it not only prevents concussion, but it assists also in the elevation of the limb every time the foot comes to the ground, thus materially contributing to that free and easy elastic action which is so pleasant to witness.

Now, with reference to the stable management, an idea is prevalent that it is imperatively incumbent to stuff the feet with offal in order to preserve soundness. This practice emphatically tends to promote the opposite effect, and when enforced, acts as an aggravating cause by softening the solar surface of the foot, thus facilitating the application of the drawing-knife, whereby the manipulator is enabled to carry out his pet scheme of cutting huge portions of the foot away, as it yields unresistingly to his efforts,—taking a savage delight in cutting the foot to fit the shoe, instead of making the shoe to fit the foot. Abolish, then, this practice of stuffing, seeing that it softens the foot, and exposes it to bruises, contusions, and injuries more readily.

Another evil which is productive of great harm, and one of frequent occurrence, is accomplished in the forge while fitting the shoe. In many instances the shoe is applied red-hot, enveloping not only the operator and animal, but also all surrounding objects, in a complete cloud of smoke. Now this is done in order to render easy the process of reduction by the knife. But its destructive effect is not only immediate, but permanent; for it deprives the foot of one of its special sources of health, which is essential to soundness,—and that is, the hot iron extracts the oleaginous secretion of the hoof, or, in other words, withdraws the oil which is necessary for the healthy sustenance of the horn, rendering it friable and brittle, increasing its liability to disease, while it is robbed of its life-giving nutriment.

I have only to add one other instance of mistaken benefit, and that is the belief in rasping. We have too much of this going on. The wall or hoof is the bulwark of the foot; therefore to remove it needs no comment.

Founder.

We will now consider another disease, the active symptoms of which are confined to the foot, although its primary cause is far removed from the terminable seat. It is one of frequent occurrence, and is often produced through sympathy, over-kindness, inattention, or want of common-sense. It is produced

through sympathy, by allowing the animal free liberty to appease its thirst with cold water when over-heated. It is produced by over-kindness either in feeding or watering when warm, and by indifference on the part of the employee; while other causes which favour its development are ignored, or unknown even to the animal's most intimate attendant. Therefore it may be found advantageous to those interested to be furnished with such information as will assist them in its prevention, and help to a remedy when it occurs; for if once an animal has suffered from this disease, there is no guarantee for its absence, as it is extremely susceptible to any future attack, and may ever after be regarded as predisposed to it. The disease then is termed, accepted, and recognised in ordinary parlance as *founder*, the technical term being *laminitis*. Under this its proper appellation let us review it, avoiding, as far as possible, technicalities of a confusing nature.

This disease, then, is divided into two distinct forms—idiopathic and metastatic—which are again divided into acute and chronic. The one form arises from over-working or violent exertion, over-feeding, or injudicious watering; the other form, from disease of the mucous membranes generally. Again, in the acute form it arises from inflammation of the bone and sensitive laminæ—that is, the sensitive structure that is confined by the hoof; and in such cases the

pain is most excruciating. As the parts affected are bound up in a limited space, exudation cannot take place. The pulse will be full, strong, and bounding; the fever great, which will continue for a considerable time: accompanying this there is always a tendency to congestion of the lungs. When the disease has continued for several days, the parts suppurate and separate, the horny from the sensitive structure. This exudation, which separates the laminæ, presses the bone downwards and backwards, producing pumiced foot.

Metastatic laminitis usually follows *bronchitis*, *enteritis* or inflammation of the bowels, and disease of the mucous membranes: the sensitive structure being folds of the true cutis, the irritation extends to the foot. This being observed, the visible membranes situated in the eye and nose will be hot, dry, and inflamed, due to indigestion, an error in feeding, and the consequent extension of the inflammatory process. The sequel to this disease is pumiced foot, seedy toe, suppuration, and a tendency to canker.

Now a horse suffering from this kind of founder does not only die from fever and irritation, but there is sometimes a sanious matter exuded which is taken into the system, producing death by blood-poisoning. This form frequently affects all the four feet at the same time.

The symptoms of laminitis or founder being so

distinct, there are few who are not conversant with its appearance and mode of attack, which we will now endeavour to explain.

In the acute form there is great fever; the pulse full and bounding; the animal rests upon his heels; the hind-legs are drawn underneath the abdomen; he shifts his fore-feet occasionally, trembles, sweats profusely, and turns with a painful groan. In both forms he seldom lies, but if he does, the pulse falls immediately about 30 beats less per minute. Owing to the weight of the animal being removed from the feet, there is often considerable difficulty in getting him to rise again: as he experiences a modification of, and transient relief from, pain, so he will rest if allowed—he is afraid to walk. In consequence of the excessive pain the breathing is quickened, the mucous membranes injected, and the bowels irregular, while the excremental material discharged will be covered with mucus.

Treatment.—If due to irritation and inflammation of the mucous membrane, the giving of purgatives is decidedly objectionable: this can be practically demonstrated, for if you give a healthy animal a strong dose of purgative medicine, you will produce metastatic laminitis. But if the disease is brought on by some crude indigestible food, the excrement hard and dry, with an absence of inflammation in the visible membranes, you may administer with safety a dose of physic. If the fever is great, combat it with

aconite; if the pain is excessive, give opium, and you will relieve it: follow up this by the application of hot bran-poultices to the feet, and you soothe the parts directly affected. If the animal will not lie down, cast him, and very soon he will award you his best thanks by a grateful sigh of relief; remove all the shoes as gently as possible, and do not permit the knife to be applied to any portion of the foot. If there is an acid condition of the stomach, the patient will lick the wall, as instinct guides him in that direction in search of lime to allay this irritability. You also find that the urine will not be evacuated freely: this is owing to the inflammation extending to the bladder; the acid produced is taken into the tissues, causing irritation, hence the inflammation. Give, then, carbonate of soda three or four times during the day. Now that the active symptoms have been arrested, put on a complete set of bar-shoes, dished out so that they are entirely free from any pressure upon the sole; apply cold water constantly; if you are near a running stream or pond, place the patient in it for twenty minutes at a time; exercise upon soft pasture for other twenty minutes,—and so on during the day, taking care to have the animal well clothed. Continue this course for some time, the diet consisting of bran-mashes, with a small allowance of fodder. If after the lapse of three weeks he still goes lame, blister smartly round the coronets, and rest.

Should it terminate in chronic laminitis, the structure will become altered, presenting hollows in the middle of the walls of the crust, the lines running around the hoof. This is the most insidious form of founder, as there is a gradual change of structure in the foot, and a concavity begins to appear at the toe. This may be prior to any lameness, but he will now go tenderly, and on his heels. Great heat will be felt round the hoof and coronet; the horn becomes very brittle, when it is difficult to keep the shoes on, and the blacksmith is innocently blamed. An acute attack may supervene from any trifling cause, or the disease may proceed gradually until the animal becomes wholly useless. In the chronic form the *os pedis*, or the bone that corresponds in shape to the foot, becomes involved also; absorption takes place round its edges, rendering it flat and convex.

The class of animals that are most subject to founder are heavy cart-horses with broad feet and narrow heels, and little fat ponies. It must also be remembered that there are other causes favourable to its development—namely, weight of the animal, and the removal of the sole by the knife.

With reference to bleeding in this disease, I will present my arguments when we come to consider inflammation as it affects vital organs. Meantime it will be sufficient for the reader to understand that I have no faith in, and consequently I am an opponent of, the practice of blood-letting.

Seedy Toe.

We now pass on to the consideration of a disease situated at the toe, termed expressively seedy toe. It is an unhealthy secretion of the cells that attach the horny to the sensitive laminæ, and consists of a mealy or cheesy kind of horn, with a bulging of the wall of the hoof immediately external to the seat of the morbid secretion. It is generally situated at the toe, and is frequently caused by the clip of the shoe being hammered too tight. It may or it may not cause lameness.

Sometimes you find those insidious cases where the eye can detect nothing at first sight. You then proceed to examine the foot carefully, by means of tapping it with a hammer, when just opposite the part affected you get a hollow sound; and by paring you may discover a slight crack, or the unmistakable bulging in the wall.

Treatment.—If due to the clip, remove the cause. Separate the unhealthy from the healthy; failing that, strip the part entirely, blister round the coronet, and rest.

Thrush

is a morbid secretion of the sensitive frog, situated in its simple form in the cleft of the frog. The discharge is a peculiar cellular secretion, sometimes mixed with pus, possessing a fetid odour.

Should the disease embrace the whole of the surface of the frog and commissures, then it is termed a running thrush.

In winter, owing to the frog having been denuded of its horny fibres, the sensitive and inner frog becomes exposed, and it is liable to be frost-bitten, causing great pain and lameness. Sloughing takes place, accompanied by high fever.

It is an ailment sometimes symptomatic of navicular disease; but it is generally found independently in the hind-feet, resulting from external causes, such as the animal standing in offal and filth.

Treatment.—Give a dose of physic, poultice for a day or so, keep clean, and dress with sulphate of copper or calomel.

Canker

may be produced from a neglected thrush, or from grease. In this disease we find the horny fibres formed as usual—in fact there is a hypertrophy of the papilla, with the increased secretion of the horny fibres, the cells of which are, however, different in their glutinating material, and are thrown off before they become finally developed.

The extraordinary tendency to the production of these cells is the worst feature we have to contend with, as it is next to impossible to check the discharge; therefore the pus, when it runs under the parts, detaches the new and also the old horn.

Symptoms.—Discharge from the frog or sole of a cheesy fluid, sometimes mixed with pus, accompanied by the development of fungus possessing a fetid smell. There may be excessive lameness: it is always an unsoundness, and very difficult to cure.

Treatment.—Strip the sole and other portions of the wall where the cancer is situated, apply tincture of iron on tow to the parts, and bandage up the foot. If there is any fungus, of course it must be removed. Allow this dressing to remain on for two or three days, then put the foot into a warm bath until the dressing is separated from the wound: having done so, apply chromic acid in its crystalline form, as it has an inherent property of absorbing the watery part. If the fungus still grows, you can apply caustic; but you must exercise the greatest care in doing so, for if you apply it too long, you will destroy the healthy and vital parts entirely. When the parts become covered with horn, and the foot is regaining health, gentle pressure must be applied.

The skin of the leg terminates in the coronary band, and secretes the outer layer of horn; the inner layer is secreted and fed by the sensitive laminæ. This band, then, the coronary band, is liable to two diseases—namely, first,

Carbuncle.

Carbuncle is a violent inflammatory process affecting the coronary substance, and spreads so rapidly that

death of the entire part soon takes place. It makes its appearance as a small spot like a boil, and increases with alarming rapidity. It is due to a specific poison, analogous to glanders, and terminates in death of the substance.

Treatment.—The point of inflammation must be severed by making a crucial incision; then dress with astringents, and inject strong carbolic acid, in order to alter the state of inflammation. After this, poultice, keep the bowels open, if the fever is great give aconite, dress with sulphate of copper,—and blister, should the inflammation involve the whole substance. Treatment is of no avail, as death of the whole part is the sequel; consequently no hoof is formed.

Overcrowded, badly drained, badly ventilated stables often produce it, therefore the cause must be removed.

The second is

Villitis,

or simple inflammation of the coronary band.

Symptoms.—The crust is dry and shrivelled, due to the morbid secretion of horn, and the animal walks with his heels on the ground.

Causes.—Excessive work, bad shoeing, and high caulking.

Treatment.—Cold-water applications, thin-heeled bar-shoe, blister, rest,—and, as a rule, recovery.

Quitter.

This is one of the most unwelcome diseases we have to contend with. It consists in ulceration of the skin of the coronary substance, communicating with the deeper textures by means of sinuses.

Causes.—Treads, grease, pricks, corns festering, canker, or gathering nails.

Treatment.—Remove the shoe, search for the cause, and if not seen endeavour to reach it by probing the sinuses; if discovered, remove it; thin the horn with rasp and knife to prevent pressure, poultice thoroughly, and inject a solution of corrosive sublimate. If the disease is situated in front of the coronet, you must employ a very mild dressing, for fear of producing open joint. Setons are sometimes beneficial, and in such cases professional assistance had better be employed.

Ring - bone

is of two kinds—true and false—due to an inflammatory process going on in the internal structure, throwing out a deposit which embraces the coronary bone, and resulting in exostosis upon the extremities. This is termed the preparative process. The lameness is not caused by this exostosis, but by the caries going on in the internal parts. These ulcerated extremities rubbing upon each other cause intense pain; then nature, to remedy the evil,

joins the two opposing surfaces together by an exostosis.

Again, there is ring-bone seated around the coronary band at the top of the hoof. This is called low ring-bone, and varies in size. When the disease commences in front, it produces more pain than when it affects any other part.

The causes are hereditary, structural, and incidental.

Horses possessing straight upright pasterns are more liable than others to this disease; the reason being that concussion falls direct upon the columns of bones. Animals with high heels are also exposed to an exciting cause. When it occurs in the hind-legs, it arises from sprain of the ligaments, and the animal will walk upon his toe; when in the fore-leg he will walk upon his heel: therefore you can almost at once detect a horse with ring-bone. If he walks upon his heel, and there is an absence of heat, pain on pressure, or swelling, that fact alone is sufficient to establish your verdict.

Treatment.—Many bleed from the toe, in order to relieve the parts; but I have such a confirmed horror of the practice that I cannot recommend it. The advocates of such treatment maintain that you give relief at the time. This is true enough, provided you could retain this progress; but whenever you arrest the flow of blood from the wound you have inflicted, immediately it collects in its original seat;

besides, the pain such a wound causes is never considered, which takes the ordinary course of time and dressing to heal, while the solar part of the foot is also weakened and impaired. No; if you wish to benefit your patient, the remedies must be soothing, such as hot poultices. This will relieve the pressure —perhaps not so rapidly, but it is permanent and effectual, and is certainly preferable as a means to reduce the inflammatory process, which is the desired object to be attained. Give also a dose of laxative medicine.

Secondary treatment.—Put on a bar-shoe, and should the disease continue in opposition to your remedies, fire and blister at once, and rest for three months.

Side - bone.

This is analogous in every other respect to ring-bone, excepting its seat. It occurs at the heels, and consists in ultimate ossification of the lateral cartilages or wings of the foot.

Treatment.—The same as for ring-bone.

Corns, &c.

Corns are produced by careless shoeing or tight shoes, thus producing a bruise. Have this pressure removed, not by mutilating the foot, but by springing the shoe, and the effect will cease. Pricks and other injuries from external causes must be treated as I have already indicated,—first, by the removal of

the cause, when the effect will cease; second, by soothing remedies; and lastly, if obstinate, counter-irritation.

Composition of the Bones.

Before entering upon the diseases that are peculiar to bones, it will be advantageous to the reader to understand the structure and composition of the material that supports the weight of the animal and protects the internal organs.

Bone, then, is composed of two distinct parts—namely, earthy and animal matter—in the following proportions:—

Phosphate of lime,	51.04
Chloride of lime,	2.00
Soda and chloride of sodium,	1.20
Carbonate of lime,	11.30
Carbonate of magnesia,	1.16
Gelatine and fat,	33.30
<hr/> Total,	100.00

The earthy and animal matters are so completely blended together, that they appear like a homogeneous mass. Such, however, is not the case, as they can be separated in the following manner: If you steep a bone in hydrochloric acid, you can dissolve out the earthy matter; and by burning you leave the earthy matter, while you destroy the animal. These earthy salts are found in all animal structures. If you make a transverse section, thus , in a bone, you

find an opening called the haversian canal, which ramifies into the compact structure. Around these canals the osseous matter is deposited in layers or laminæ. Then again, around these canals are spaces of an oval shape, termed lacunæ, or empty spaces. There are also numerous fine thread-like canals which run outwards from these haversian ones, and joining the lacunæ, are termed canaliculi, or little canals. Inside of these are the true bone-cells, extending from the lacunæ to the haversian canal, which conveys the plasma of the blood, thereby affording nourishment to the whole bone.

Bones are covered with a material called periosteum, which is nothing more or less than fibrous tissue adhering firmly to the bone. This periosteum is the chief source of supply for the compact tissue. It is from its inner surface that the blood-vessels pass into the cancellated tissue, while the bone also receives support from the nutrient arteries which traverse the internal canal, then break up into fine plexuses of blood-vessels.

Diseases of the Bones—Rachitis.

When bones are deficient in earthy matter, we generally find rachitis present. In this disease the bones are imperfectly ossified. It occurs in two forms—acute and chronic. Young animals are liable to attacks of the acute form, known as joint-ill. It affects the articulations, causing lameness, with

swelling of the joint, more especially the knee. The inflammation increases, so does the lameness, suppuration sets in, and the result is an open joint, accompanied with inflammation of the other joints. This form terminates fatally, as the patient wastes and dies in great agony.

Causes.—Insufficient supply of milk, and exposure to damp and cold; also where the water is soft and deficient in lime-salts, one of the essential constituents of bone.

Treatment.—As the causes here are removable, you must attend to them; but with careful management you need not be troubled with the disease, as its prevention is easy, and better than cure.

In the chronic or subacute form the shaft of the bone towards its extremities begins to bend. This will not happen until the animal is six or eight months old. Commence at once by giving an excess of lime-water, with small quantities of good linseed-cake,—in fact, the best food and shelter you can command. Put splints on the limb, and bandage up, but not too tight, when it will again recover something like its former shape.

Mollities Ossium

occurs in full-grown animals, but presents no symptoms during life. It is a constitutional disease, being the conversion of the animal bases into fat. Such

subjects are liable to splints, spavins, ring-bone, &c. There is no treatment.

Osteo Porosis.

In this disease there is a distention of the haversian canals, containing a juicy fluid along with the blood-vessels. It is seen when the distention is most active, the parts being in a highly vascular condition. Professor Williams thinks it is owing to a deficiency in the material for building up the haversian canals; consequently the blood-vessels force themselves in, and the walls distend.

Symptoms.—Swelling of the face, discharge from nostrils, and the patient unable to masticate its food. This disease, the same authority says, arises from outward causes; but if we have a discharge from the nose, it may be due to derangement of the fifth nerve, which nerve seems to preside over the nutrition of the face.

Osteo Sarcoma,

or a fleshy and bony tumour, frequently affects cattle, and attacks the jaw. It has no connection with the teeth, as supposed by some. In nasal gleet we may find such a tumour, which must be removed by the knife.

Enchondroma,

or tumour on the sternum or chest. This tumour may be hard, hot, and painful to the touch, and,

if allowed to continue, becomes converted into cartilage and fibrous tissue. Remove the cause, and it disappears.

Inflammatory Ostitis,

or inflammation of bone. In our class of patients this disease is always the result of injury, or propagated by neighbouring tissue, such as cartilage and periosteum. It is sometimes acute, and at other times chronic: acute in sore shins, &c.—chronic in old-standing complaints. It sometimes affects the outer layer or periosteum, and sometimes the inner layer.

In some very acute cases of laminitis the animal dies from the absorption of the exudate, which acts as a poison. There is only a very moderate degree of inflammation, which, however, throws out a deposit that is converted into bone, although not true bone. The result of this is—first, exostosis; second, caries; third, necrosis.

Splints.

Splint is an example of exostosis, the seat of which every one familiar with horses knows.

Splints are of various forms; simple, when they do not interfere with the knee or tendon—double, when they extend directly across the limbs. The deposit generally takes place beneath the suspensory ligament.

There is another kind of splint, situated upon or at the side of the knee, producing more or less stiff joint.

Splint lameness arises from the presence of inflammation in the bone and periosteum, producing an exudate between these two structures, which stretches the fibres of the periosteum, causing pain.

Again, we find splints without lameness. This is owing to the consolidation of periosteum. In such a case the horse will walk sound and trot lame, owing to the concussion; but when a splint is fully formed and of a simple nature, the animal will not go lame.

In navicular disease, as distinguished from splint, the animal walks and trots lame. This, however, disappears when he has been on the road for a while.

Treatment.—Reduce the inflammation by fomentations, administer a purgative, and blister. Should this fail, fire and blister; or have an operation performed, whereby the splint is separated from the bone by the knife.

Small pear-shaped splints are the most difficult to deal with, as they do not become fully developed. When lameness continues, counter-irritation and rest must be had recourse to.

Spavin

is of two kinds—bog and bone. Bog-spavin is a disease situated in the true hock-joint; bone-spavin is an exostosis between the inner and lower sides of the joint, whereby bones that were slightly movable

become fixed. The reason that this disease is seen on the inner side of the hock is,—first, because it is on the central line of gravity; and second, from the general arrangement of the bones connecting the hock, for when the limb is forcibly flexed, great pressure is thrown on this part. All the changes, therefore, that take place are due to *ostitis*.

Causes.—Hereditary; special and peculiar formation; also due to local injury. Young and overgrown horses are liable to *spavin*; and in hocks where the *os calcis* is short, or what is termed a *tied-in hock*, there is more susceptibility to it; also when the head of the large bone is small, and long at its articulation with the small bones of the hock, you invariably have a *spavin* produced.

Again, you may observe four-year-old animals showing a coarseness of hock, which passes away before they are six or eight years old. If this coarseness be far back, the hocks are likely to be sound; but if in front, they render the animal liable to *spavin*.

Lameness from *spavin* is first observed in the stable. As you move the horse from side to side in the stall, he limps upon the affected limb. If you trot or walk him he may show signs of lameness; but it disappears when he has gone a few steps, owing to an increased flow of *synovia*, which lubricates the joint. This is often taken advantage of in the market, by the deceptive practices I have already narrated at the commencement of this treatise.

In tracing the progress of this disease, we find that inflammation commences in the spongy texture of the bone, extending into the surrounding textures and synovial capsule; hence ulceration of the articular cartilage is the result of this process going on in the bone.

Treatment.—Subdue the inflammation; if he stands upon his toe, put on a high-heeled shoe; and if ulceration has taken place in the bone, you must assist it, in order to hasten the exostosis, and bind the parts together, which will be accomplished if you fire and blister, as by this means you cause a rapid deposit of lymph, which becomes ossified. Professor Williams recommends setons, upon the ground that you have an increased amount of irritation. This is certainly true, and may be beneficial in old horses, as the difficulty is great; but in ordinary cases affecting young horses, the cure is comparatively easy without resorting to such extreme measures.

Another characteristic sign of hock-lameness, ere I close this subject, is, that the animal wears the shoe away at the toe, and in confirmed lameness he drags the toe along, catching the leg up with a jerk, as he is afraid to put the foot flat to the ground.

Caries and Necrosis of Bone.

There is not an extremity of bone which is not liable to caries. Caries corresponds to ulcer of the soft parts: in its course it is frequently chronic,

although from the devastation it produces (especially in the true hock-joint), it appears to be acute. When caries is superficial, it presents the appearance of a moth-eaten substance; when it affects a large articulation, accompanied with bleeding, it is both a diagnostic and fatal sign, because the laminar layer has been removed; hence the haversian canals and blood-vessels are now exposed to the friction of the part.

The discharge from a carious bone is of an acrid nature, and will blacken a silver probe. Caries is healed by a change of unhealthy to healthy granulations.

Treatment, to be successful, depends greatly upon subduing the inflammation. If in an open joint, the application of a powerful counter-irritant will assist in its prevention.

Necrosis

is in every way analogous to mortification of a soft structure, and differs from caries by the vitality of the part being entirely destroyed. It resembles dry gangrene, and arises from some external injury to the bone, or from any cause by which the bone is laid bare or crushed.

Necrosis is of two kinds—total and partial. The boundaries of a necrosed bone are irregular in every way. It produces extensive inflammation in the adjoining healthy bone and tissue; suppuration takes

place, and goes on until the offending portion or necrosed part of the bone is removed. The pus discharges itself externally, carrying with it small pieces of the diseased bone. It is distinguished by its bleached appearance and irregular borders; the bone in contact with it assumes a rosy colour, becomes succulent, and is finally removed by absorption. The line dividing the two is called the line of demarcation. The inflammation that exists leads to a deposit being thrown out beneath the periosteum, and as this extends into the interior, the bony matter is there deposited.

Causes are intrinsic and extrinsic: in the former, no remedy can be suggested; in the latter, remove the bone, giving tonics, good food, and lime-water to drink.

Proceeding now to the remaining causes of lameness that claim our attention, let us briefly and collectedly examine them. A horse may go lame at one time and sound at another; or it may be so slight that it is scarcely visible; or only so when the animal steps upon a stone or makes a rapid turn; or, again, if stopped on a journey, he may start quite lame.

Again, many military horses appear to go lame in either of the fore-limbs, as the case may be; but this is an acquired habit, from being constantly exercised in a circle. They take a short step with the leg nearest the inner side; this is termed bridle lameness.

The symptoms of lameness are of two distinct kinds—one discoverable by action, the other while the animal is at rest. By the first we discover the limb; by the second, the seat and nature giving rise to it.

Again, many cases are diagnosed by their peculiar gait. If we have lameness without heat, pain on pressure, or external swelling, there is good reason to conclude that it is deeply seated.

Sprains.

A sprain may be defined to be violence inflicted upon soft structures, with extension and often rupture of the fibres connecting the part; or a muscle may be sprained by over-extension or sudden contraction. The strain by over-extension is often produced by jumping or slipping of the foot.

The muscles of the back, whose action is to bend the haunches upon the pelvis, are sometimes the seat of sprains. This may be produced by the animal rearing, and is characterised by inability to bend the back; in fact, the back appears to be slightly concave, and if the horse is down, he will be unable to rise. It resembles paralysis, but is distinguished from it by the fact that he has control over the limbs, and can flex them, and possesses command over the tail, so that he can move it at will.

Treatment.—If you examine with your hand internally, you will find the parts hot and tender to the

touch. If he is down, you must turn him over frequently, keeping plenty of straw about him. Give a laxative dose of medicine ; if he is restless, fighting, struggling, and feverish, give opium and aconite, with soothing applications to the back ; and if he can be got into slings, do so without delay.

After the acute symptoms have subsided, atrophy or wasting away of the muscles takes place, and weakness of the back is the result. Let him have liberal nourishment and plenty of rest.

SPRAIN OF THE MUSCLES OF THE SHOULDER.

In a horse suffering from acute lameness in the near or off fore-leg, if the seat of the ailment be in the shoulder, you will observe when you enter the stable the pastern of the lame limb straighter than the other one ; he will point the affected limb, and draw it under him from time to time.

Young horses, when first put to plough, are exposed in the following manner to sprain of the muscles of the shoulder, or, as it is termed by many, shoulder-slip : The animal has to travel with one foot on the land and the other in the furrow ; therefore there is a sudden drop from the land into the furrow, while he is drawing perhaps more of his share than he ought. I would therefore suggest that the young horse should be placed upon the land instead of the old one — at least until he has arrived at maturity — and some other means

adopted to restrict his wandering out and into the furrow.

Injuries to this region tax the patience of the owner, more especially if work is behind, as it requires long rest to effect a cure.

Treatment.—Remove the inflammation by hot fomentations, constantly applied night and day. Continue this for three or four days; afterwards blister, and allow complete repose.

As atrophy of the muscles takes place in this disease, it requires a long time to efface what was easily and simply produced.

SPRAIN OF THE ELBOW-JOINT.

In sprain of the muscles in this region the leg is usually in a flexed condition, the toe being placed behind that of the sound limb. The animal is nearly or wholly incapable of moving it. If the sprain is a severe one, place him in slings if practicable. Apply hot water, give an aperient, afterwards blister, and rest.

Capped Elbow

is an abscess containing a serous fluid, and arises from the horse lying down upon the heels of his shoe. A tumour is also frequently found from the same cause, which must either be removed by the knife, or in the following manner by the application of caustic: Take five grains of arsenic, ten grains of corrosive sublimate, mix them together, heat on

a fire-shovel for a minute or two, then wrap the ingredients into a piece of paper, and insert this plug into the tumour, when in a few days a large lump will drop out ; inject into the cavity a slight caustic dressing, and allow the wound to heal by granulation, remembering always to remove the cause. This can be accomplished by strapping a nice soft pad round the heel, which will effectually prevent the animal injuring this part.

Carpitis, or Inflammation of the Knee-joint.

In the chronic form this affects both knees : the action is characteristic, and quite distinct from navicular disease. In this case the horse goes with his limb in a fixed straight line, putting his heel first to the ground. When the disease affects one knee only, the step of the sound limb is longer than that of the other, from the necessity of an attempt being made to save the infliction of pain. It is also distinguished from shoulder-lameness by the patient not dragging the toe, or striking it against the ground, while there is more weight thrown on to it. It may be simple inflammation of the ligaments, or it may be ulceration of the cartilage, with removal of the laminar layer, causing extreme ostitis.

Treatment is very unsatisfactory. However, we must reduce the inflammation, and then apply counter-irritants and rest. When he recovers, it is generally with an ankylosed stiff joint.

Broken Knees

are the result of accidents. Various causes are in operation to produce them. A high stepper will come down by striking himself, or an animal may take a fit and fall, or from the foot becoming too long, or in many a way best known to the driver or rider.

Broken knees may be considered of four kinds—

First, when the skin is bruised, but not cut; second, when the skin is cut, with bursæ and tendon exposed; third, when the wound penetrates through the tendon and exposes the bones; fourth, when the wound penetrates through the tendon, and one or more of the bones are fractured.

Treatment.—The first requires none, with the exception of an aperient. In the second case, when the skin is cut and bursæ exposed, there is always a slight escape of synovia, therefore clean the parts thoroughly with cold water, dress with a solution of carbolic acid, and give an aperient. With reference to bandages being applied, I leave this an open question, as you must be guided by the circumstances of the case. Speaking for my own practice, I have never had cause to regret the use of them; on the contrary, I have found their timely application very beneficial.

If fungus appears, you must ascertain if it is not due to some irritant about the parts. If so, remove

the cause; but if from no irritant, reduce it by caustics, after which a scab will form, and the wound will heal underneath it. Again, if the skin is hanging down over the leg, and is not dead, have it well washed and returned to its place. Keep it there by strips of plaster, when it will again unite,—by this means you leave a very small scar; but should the skin be dead, of course it must be removed with the scissors. Keep the hair from touching the edges of the wound, and in this manner you will be enabled to report satisfactory progress. If the tendon is injured, and the bones fractured, treatment is of no avail.

Rupture or Sprain of the Suspensory Ligament.

This is termed in racing parlance **BREAK-DOWN**.

There is a descent of the fetlock to the ground, so you must put on a high-heeled shoe, fill up the hollow of the pastern with pads tightly wedged in and bandaged, treat the upper portion of the limb with cooling applications, administer a laxative, and, when the inflammation is subdued, fire, blister, and rest. In process of time the ruptured ends will be reunited by a low form of fibrous tissue, and this material gradually contracts, drawing the parts together,—so that, if a valuable brood-mare or entire horse, it is not advisable to destroy it.

Lameness of the Hind Extremities.

In studying lameness in this region, take up your position behind the animal. Lameness here is generally situated from the hock upwards, and in the fore extremities from the knee downwards. The latter is due to concussion, the former to muscular contraction.

Shivering—String-halt.

This is truly a nervous disease over which we possess very little control. It exercises extraordinary influence over the affected patient, and in confirmed cases no permanent relief can be afforded. It affects the abductor muscles, as evidenced by a slight shiver when he turns round, and he may suddenly catch up his foot or not; but in a worse case he turns stiffly, while the tail is suddenly elevated when he is backed.

When it occurs in an aggravated form it is called string-halt, both limbs frequently being affected. It is purely a nervous disease,—is an unsoundness, is incurable, and becomes worse as age advances.

Relief may be afforded by the application of belladonna externally and internally.

Hip-joint Lameness

is a difficult disease to diagnose, being deep-seated. The external symptoms are: One leg appears to be

longer than the other, the whole limb will be in a stiff straight position, and if the disease has existed for some time, the muscles immediately covering the part will be atrophied, or wasted away; and on taking up your position behind the animal, you will observe a hollow on the hip affected. First, then, satisfy your mind that there is an absence of disease to any other portion of the limb, then introduce your hand into the rectum, when you will discover an increased temperature.

Treatment.—Reduce the inflammation by fomentations; after which, fire and blister, or insert a seton or two, allowing long rest.

Disease of the Stifle-joint.

If you stand on one side, you will notice a distinct swelling or enlargement; the animal points his toe; the swelling is hot and tense. When he turns, he throws his leg forward in a semicircular form, and if he is lame in the true hock-joint his step will be short.

Treatment.—Absolute repose is here necessary. Then insert a seton on each side, allowing them to remain in for three weeks.

Capped Hock

is of two kinds: first, the formation of a serous abscess between the skin and tendon as it passes over the hock; and secondly, the result of an injury.

Treatment.—This is a matter of considerable delicacy, but the best remedy is the soothing one: first, hot fomentations; then cold cooling lotions, with an aperient administered at the outset. If the swelling is hard and hangs over, a seton may be run through with good results.

Thorough-pin

arises from an injury to the tendon as it passes through the groove. On either side of the hock you will find a swelling, due to inflammation of the surrounding bursæ with extension.

Railway horses are very liable to this disease, owing to the heavy lifts they have while shunting.

Treatment is very unsatisfactory. Get rid of the inflammatory process first, and reduce by pressure; put on high-heeled shoes, and allow long rest.

Curb

is a sprain of the ligament behind the hock, and may be produced by the toe being too long. Some animals have naturally curby hocks; but if they have seen six summers, these are not likely to interfere with their action.

Treatment.—Counter-irritation and rest.

Chronic Grease

is generally confined to the hind extremities, and found as the grapy form. It is produced by swelled

legs, due to congestion of the vessels from a circulation weakened by disease, or naturally weak. In health there is a fluid exuded which keeps the heels soft; therefore, should this secretion be suspended from the parts, the heels crack and fungus protrudes. There is a large quantity of ichorous fluid secreted, which destroys the surrounding tissue, and being very vascular, it bleeds at the slightest touch. This becomes in time covered with a horny scale which is easily rubbed off.

Causes.—Want of exercise; bad state of the body; constitutional predisposing. Intrinsic and extrinsic.

Treatment.—Remove the grapes with a hot fire-shovel (such as is used in the forge), if they are numerous; if only a few, apply caustic, taking care not to do too many at a time, as you may produce extensive sloughing. After this, poultice and dress with astringents: a good application of pure carbolic acid will be found to answer the purpose admirably.

Constitutional treatment.—First a purgative, succeeded by diuretics and tonics, such as the sulphate of iron 2 drachms, powdered resin 2 drachms, given in the food night and morning. Liquor arsenicalis has a capital effect, but had better be administered by the veterinary surgeon.

Examination Observations.

Having now finished lameness, giving the reader a description of the various diseases appertaining

to the limbs and feet, I have deemed it advisable to place you in the position of examiner; therefore the following hints as to the method and diagnosis of ailments may not be amiss in making an examination while you contemplate purchasing.

Assuming, then, that the horse is in the stable, and has been allowed complete repose for at least one hour, you proceed with your examination in the following manner: First, on entering the stable, take particular note how he is standing. Permit no cracking of whips or other startling noises; these attract the animal's attention, causing undue excitement, whereby he often forgets a slight lameness, or has drawn himself up into the position of expectancy, and is prepared for alarm. Where such is the case, you fail to find him reclining in his easy, natural way; or if disease of the hock, in the shape of bone-spavin, is commencing, or navicular disease beginning, he will evince no symptoms to attract your attention, because he is on the alert and is afraid of punishment, consequently the pain is ignored for the time being.

Having proceeded in a quiet, seemingly indifferent, cautious way, observe how he stands—if he points a fore-foot, or stands in an easy, careless manner. Some horses point a fore-foot through habit, but they point a hind one at the same time in a cross fashion. Next have him moved from side to side in the stall, watching if he limps with either of the hind-legs.

Then have him brought out, noticing his every movement closely. This done, place him on a level piece of ground, and cause him to stand square and straight. Now take up your position right in front, while you direct your attention to his eyes. Compare them, and if one is smaller than the other, disease is present. Observe the cheeks, whether one is fuller than the other. See that there is no discharge from the nose, and notice whether the mouth is closed or the lips hanging pendulous, or if there be any twitching of the lips. Next look at the shoulders; compare them, and see that there are no irregularities. Proceeding downwards, look for enlarged or broken knees, speedy cuts, or splints. Compare the two pasterns and feet, observing if they are alike in size and appearance. Next pass to the side at a few yards' distance from him, taking a general survey. When opposite the hind extremities, look out for enlargements of the stifle-joint, capped hock, curb, bog and bone spavin, thorough-pin. Then stand behind and compare the quarters, and see that one is not lower than the other. Of course everything is taken in for further examination. Pass round the right side in a similar manner, until you have reached the head.

You must now approach him gently in a horseman-like way on the left or near side. Examine the mouth and nostrils. Pass the right hand into the space between the jaws, feeling as you do so for any

enlarged glands, and on the top of the head for poll-evil. Now turn your face towards his hind-limbs, at the same time passing your left hand along the neck and shoulder, to feel for fistulæ or warbles. Then turn your face to his, pass your right hand down the front of the leg, taking note of any enlargements ; feel for ring-bone and carbuncle, and look for sand-cracks. Then turn yourself again, and feel and look for shoulder-slip, capped elbow, sprains, contracted tendons, splints, and side-bones. Pick up the foot, and search for corns, thrush, contracted heels, and flat soles. Then place the foot in the hand of an attendant, while you examine by manipulation the hind-legs, by passing your hand down over the hip and stifle ; and feel for spavins, curb, thorough-pin, capped hock, —the sight, however, is better than the touch to detect curb. The tendons may be thickened — the result of a sprain — therefore compare them. Pick up the foot, examine it ; go to the right or off side, and proceed in the same way. Then trot the horse, watching attentively the suspected limbs. When he returns, back him, and turn sharp round, looking out for string-halt, or cleek, as it is often called. Examine his sight, and, finally, test his wind.

PART II.

INFLAMMATION.

THIS, as the term signifies—a setting on fire—is so alarming, that whenever the expression escapes the speaker's lips, the announcement is received by every one conversant with the ailments of the lower animals with the utmost concern and anxiety,—such fears being unhappily justified by its extraordinary fatality, more especially when the disease is in the bowels and surrounding coverings, and the animal a valuable one.

In no disease affecting the horse is there more intense pain endured. Fortunately the issue is so rapid and incisive that death soon releases the sufferer; and whenever a practitioner announces that the patient has inflammation of the bowels, the invariable query is, *Bleeding*—will it do any good?

This being a question of considerable importance in the treatment of inflammation, we will dispose of it first.

In discussing this blood-letting remedy, many suppose, assert, and maintain, that by its adoption you diminish the inflammatory process going on in any organ or region of the body. Such an idea is entirely fallacious, and a little examination into the character of blood, and how it acts in an inflamed part, will demonstrate its absurdity ; for where we find inflammation, there the circulation becomes arrested, and stagnation is the result.

How, then, is this stoppage to be cleared away ? Certainly not by bleeding, since the blood has become coagulated in the part, and therefore can no longer flow. So if recourse is had to this remedy, you diminish the strength of the patient, impair his vitality, increase the exhaustion, and hasten death, because you have removed the principal power of resistance.

Take a practical analogy. Supposing you have a stopped drain to contend with, you are aware that water is not the obstruction, but that there is some material which has effected a lodgment, consequently the water is directed out of its usual channel. In such a case you would consider it extreme folly to open the drain at a distance of seven or eight feet from the obstructive material, therefore you would make your opening in the immediate vicinity of the stoppage, in order to reach the cause, which once reached and removed, the water resumes its course uninterruptedly. This is exactly the posi-

tion with bleeding. The blood is not the obstruction or the cause of inflammation, but it is the irritant that has effected a residence in the part—hence the inflammation as a result of this irritant. Remove this irritant, then, as you would remove the obstructive material from the drain ; and when you accomplish this, the effect will cease and the inflammatory process will be arrested.

We will now proceed to the definition of inflammation by some of our leading authorities.

Dr Hunter says: "Inflammation is due to an increased action of vessels, observing, at the same time, that dilatation of the vessels was as much an evidence of power as the contraction." And again he says: "Such is inflammation,—blood much altered, stagnant, or tending to stagnation ; capillaries over-distended, the coats of which are spongy, soft, and lacerable; copious exudation of liquor sanguinis; extravasation of blood by lesion of capillary coats ; absorption in abeyance; nutrition and function perverted ; structure changed ; texture softened and enlarged ; suppuration in progress, with part of texture breaking up ; nothing healthy or consistent with local health,—all essentially diseased."

Professor Syme says: "It is a perverted action of the capillary system, attended by pain, heat, redness, and swelling."

Dr Alison says: "It is a peculiar perversion of nutrition or of secretion."

The cause, then, of this *stagno* or stagnation is an irritant, which irritation must be looked upon as one of three processes—

First, nutritive; second, functional; third, formative.

Having now this irritant as the exciting cause, if the part is vascular—for inflammation cannot exist in a part containing no blood-vessels, but exists in the parts immediately surrounding it—the nutrition becomes perverted, then congestion of the parts takes place, while the capillaries first contract, then dilate, and the blood meantime flowing slowly, becomes irregular and oscillates, until complete stagnation occurs. At this period the vessels become greatly distended, the red globules of the blood grow adhesive and stick to the walls of the vessels, while they also adhere one to the other.

Again, in some cases the vessels present dilatations of their whole circumference at certain parts of their course, due to the thin parts of the wall bulging out, from the accumulated pressure of blood within.

The next process is the extravasation of serum (namely, the watery portion of the blood) into the surrounding tissues. This also takes place in health; but in inflammation the quantity exuded or given off is in greater abundance than is required, and has to be absorbed by the cells of the surrounding tissue, thereby producing enlargement of the parts.

Again, the blood may extravasate from rupture of the vessels' coats. Should this occur, sudden obstacles spring up, which suspend the life of the parts for a time, and if very acute may destroy it altogether.

Some writers assert that constriction of the vessels never takes place prior to the dilatation. But if you irritate a part with weak vinegar, the constriction takes place very slowly; and when you apply a strong acid, the constriction is so rapid that it passes into the dilated condition almost at once. The dilatation, then, is of a passive nature, and arises from the walls being unable to resist the pressure of the blood, as they are weakened and debilitated.

Stagno, or complete stagnation, then, is due to the increased vitality of the tissues themselves, which draws the blood to them like a loadstone attracting iron to itself.

Having now directed your attention to this indisputable fact, pointing out the origin of inflammation, and how an irritant exerts its power over the circulation until it has finally arrested the flow of blood, you will perceive that blood-letting resorted to generally must have a pernicious effect upon the subject, and ought, in the name of justice and sympathy, to be for ever abandoned.

In considering another remedy intimately allied with blood-letting for the treatment of inflammation, it will be necessary, in the first place, to direct your

attention to an important element in the blood, known as fibrin.

Fibrin, although occupying a minor position as to quantity, is nevertheless one of the most essential constituents of the circulating fluid. It has something like a percentage of four to five, but may vary occasionally. It is through this fibrin that the wounds of vessels heal up, and if it were not for this material a mere scratch would have a fatal issue. In infants, for example, when a vessel is cut or wounded, it is a matter of extreme difficulty to arrest the flow of blood: this is due to a want of fibrin.

Again, in black-quarter, or black-leg, as it is sometimes called, the disease occurs simply owing to a deficiency of this fibrin element in the blood.

Let us consider the treatment, or rather the prevention, of this fatal disease. It is by means of counter-irritation that you can secure success, or by the insertion of a seton into the dewlap, which is the most rapid way of combating the attack when it appears amongst a herd of cattle. By this means fibrin is formed in the parts, and taken up by the absorbents, and then carried into the blood. That being satisfactorily explained in the effectual prevention of black-leg, surely it must be accepted as unmistakable evidence, that counter-irritation is opposed to the successful treatment of inflammation, as it increases the fibrin enormously; hence

increased coagulation of the blood in an inflamed part is the inevitable result, since it accelerates stagnation, rendering it impossible for the blood to flow. Blistering, then, so often resorted to in the treatment of inflammation, is a direct manufacturer of this element fibrin ; and knowing the part this constituent plays during inflammation, I have no hesitation in denouncing it as bad treatment for the disease under discussion.

The only conclusion, therefore, that I can arrive at with safety is, that soothing remedies are the successful and legitimate ones to be employed ; and that counter-irritants, being pathologically against recovery, are consequently accompanied with danger to vital parts.

We will now consider the local symptoms of inflammation, which are as follows : 1st, Redness ; 2d, Heat ; 3d, Pain ; 4th, Swelling ; 5th, Loss of function.

First, then, redness in the lower animals cannot be well observed, and is only seen upon the white spots and the visible mucous membrane. It is caused by the engorged state of the capillaries, and the blood-globules being dissolved, thus tinging the tissues with haematin, which is the colouring matter of the blood. The redness is deepest in the centre, and gradually pales off toward the circumference of the inflamed parts ; but if caused by extravasation, it will not be removed by pressure (as

in true inflammation): therefore the aspect of redness differs, according to various circumstances. If the inflamed vessels be uniformly distended, it will be of a uniform deep blush; and if observed in the mouth, they will appear as folds of red velvet.

After stagnation has become complete, the tissues are stained by this extravasated colouring matter of the blood, haematin; and when a *post-mortem* examination is made, if the subject has lain upon its back, the muscles of the back will be found completely congested and red. This, however, is owing to the force of gravity drawing the blood to the most depending parts; and the same appearances will always present themselves, no matter in what position the subject is lying, provided it has lain long enough. When such takes place after death, it is termed hypostatic redness.

The presence or absence of redness is not of itself a proof of inflammation; for in inflammation of the cornea, one of the membranes of the eye, or articular cartilage, or arachnoid membrane, there is no redness, but the parts are opaque or white.

Heat.—The temperature of the inflamed part seems higher, both to observer and patient; but this increase of heat is not so decided as one would imagine. Dr Hunter proved that the temperature is only one degree higher than the other parts. The greatest amount of heat in an inflamed part is where it is seated far distant from the centre of circulation,

and in parts where the blood is several degrees lower than that of the heart; therefore the sense of heat that the patient endures must be due to the increased sensibility of the part, combined with nervous functions. Experiments have shown that the blood going to an inflamed part is less warm than the parts themselves, and that venous blood returning from an inflamed part is warmer than that returning from other parts. And again, in inflammation of a region near the centre of circulation, instead of the temperature of the blood being increased, it is actually diminished.

Pain.—The pain of inflammation varies much in degree and time, according to its cause, intensity, and seat.

In loose structures the pain is dull, compared to dense, strong, fibrous tissues. The pain of open joints, laminitis, &c., is of the most acute nature; and in pleurisy, the pain being of a sharp darting description, is often mistaken for colic.

In acute peritonitis (the covering membrane of the bowels) the pain is so agonising that the animal is terrified to move a limb, and he does not show it so much.

Again, the pain of an inflamed mucous membrane does not amount to actual pain, therefore its presence or absence does not always indicate inflammation; and the sudden cessation of pain in violent inflammation is much to be dreaded, as it unmistakably

shows that the vitality of the part has been destroyed, or, in other words, gangrene has set in.

Again, the situation of pain is not always the seat of inflammation, as in inflammation of the liver the pain is felt in the off shoulder, and the animal will go lame on that limb. This is termed reflex pain.

In acute heart-disease the hind-legs are partially paralysed, and this is called sympathetic pain.

Cause of pain.—Some writers ascribe pain to the pressure on the nerves of the part from exudation; while others maintain that the vessels of the part become slightly elongated and stretched by each impulse of the heart. But it is owing to the actual germinal matters becoming greatly increased in the parts, as witnessed by the lines.

Swelling occurs independent of inflammation; and according to some authorities the swelling first depends upon the congested blood-vessels, with subsequent exudation and engorgement. But it depends upon the local production of lymph by the tissues on which it is found.

When swelling occurs upon an external inflamed part, it may be looked upon with favour, as exudation has taken place. But when swelling occurs upon any organ essential to life, such as the lungs, or even the throat, it may very soon terminate fatally.

Swelling, again, is not always characteristic of inflammation. For example, *purpuræ hæmorrhagaica*,

scarlatina, &c., are diseases where we have enormous swellings; yet they are not inflammatory ones.

Loss of function, or impairment or perversion of the functions.—In the first stage of inflammation, function may be increased, as in the first stages of phrenitis; and in the first stages of inflammation of the cornea, the function is entirely or nearly suspended. In inflammation of muscles their function is destroyed, while their sensibility is greatly increased.

The Terminations of Inflammation

are,—1st, Effusion of serum; 2d, Exudation of coagulable lymph; 3d, Suppuration; 4th, Ulceration; 5th, Gangrene; and 6th, Resolution, which is said to occur when the parts resume their natural function.

Taking, then, the first termination, which is **EFFUSION**,—this differs from exudation of lymph, from the fact that it occurs in the loose areolar tissue, and partakes of the general constituents of serum. Serous effusion may result from mechanical congestion, and in such cases the fluid is clear, containing very little fibrin.

Now there are two essential characteristics of inflammatory effusion. 1st, It tends to contain ingredients in greater proportion than they exist in blood—namely, chlorates, phosphates, and albuminates. 2d, They contain organic forms, and these

forms find in this exudation a suitable situation for their growth.

In pneumonia, or inflammation of the lungs in the human being, when the chlorate of soda is absent from the urine, it is an evidence that inflammation is going on as rapidly as ever; but as soon as it appears, we are justified in predicting a favourable termination.

SUPPURATION.—The formation of pus occurs in three different ways,—1st, circumscribed; 2d, diffused; 3d, superficial. In the first stage, the cells of the areolar tissue are charged with lymph, which become enlarged, and for some time multiply excessively. This is soon followed by a division of the cells themselves; and round about the inflamed part, where there were only single cells, pairs are now seen, and from them the new connective tissue is formed. Then, again, in the interior of this growth, where the cells were early filled, numberless little cells now appear, which at first preserve the form of the previous cellular tissue; and as these little cells extend in numbers and growth, the surrounding tissue now liquefies, and pus is formed. Therefore a vital change has taken place in the germs of the tissue, the whole process being effected in the cells themselves.

Healthy pus is a smooth, viscid, white, or creamy-looking substance, having no odour, and possessing an alkaline reaction. It is composed of two parts,

cells and liquor puræ. When pus is formed near bone or in the foot, it usually has a fetid smell, due to the death of the bone and the evolution of sulphuretted hydrogen. Pus consists of the following kinds: "laudable," or healthy; "ichorous," thin and watery; "sanguineous," pus mixed with blood.

2d, *Diffused*.—We find examples of this in purulent effusion of a glandered horse; for there is no pointing, as the pus gravitates to the most depending parts.

3d, *Superficial suppuration*,—met with in the mucous membranes and skin. All mucous membranes, with only a single layer of epithelium, are much less adapted to the formation of pus. Again, the intestinal mucous membrane scarcely ever produces pus without ulceration; but all mucous membranes can secrete pus without ulceration, and that through a change in their epithelial scales.

ULCERATION.—This takes place in the living tissue surrounding the dead: a groove is formed in the red line by the absorption of the living tissue; this line deepens, and the pus formed burrows in and removes the slough, below which a healthy granulating surface is exposed.

MORTIFICATION consists of two kinds—complete and incomplete.

In the soft structure the complete is termed sphacelus, the incomplete gangrene. When it exists in the blood, it is termed necræmia. Again, when the

dead tissue is visible, it is termed a "slough," and the process by which it is removed "sloughing."

Degeneration may be distinguished from mortification, as the fat does not become decomposed, and pus is not formed to carry it off by separation from the healthy part.

Mortification may be either wet or dry. It is wet or moist when the blood exudes, and then separates into its various constituents: dry is rarely seen, but has been found to follow the use of ergot of rye.

Necræmia, or death of the blood, is seen in splenic apoplexy, quarter-ill, and the last stages of rinderpest. In those diseases there are large patches of dead and decomposed blood exuded into the tissues, causing swelling, which crepitates on pressure.

Mortification may arise without inflammation, from a stoppage of blood to the part; or it may be brought about by the vessels being absorbed or destroyed by ulceration. When mortification ceases to spread, a red line is observed around its circumference, separating the dead from the living parts, which testifies that a process has been established for the removal of the dead tissue. The healthy tissue in the meantime becomes consolidated, the mouths of the blood-vessels are sealed up, there is no hæmorrhage, and the virus from the dead portion cannot be taken up by these healthy blood-vessels.

Again, mortification may take place from actual contact with other parts, as witnessed in death from

enteritis, where the bowel in its course comes in contact with any portion not already mortified.

Symptoms of inflammation are of two kinds—local and constitutional.

Constitutional are those indicative of sympathetic or inflammatory fever. These symptoms are of the greatest importance, signifying the nature of the disease when internally seated. The most prominent symptoms are the rigors, or shivering fits, that usher in the disease. These rigors are followed by an increased heat of the skin, the pulse firm and hard, accompanied by more or less disturbance of the natural functions of the animal's body. The rigors are often very severe, while they may amount only to a mere chilliness. They are, however, important, as they mark the commencement of the disease or fever. Again, rigors oftener attend spontaneous inflammation than that caused by an irritant. Some horses with weak constitutions are peculiarly liable to rigors.

Fever, then, is the effect of inflammation; and during the inflammatory process one of the most important changes that occur in the blood is the increase of fibrin, which encourages coagulation very rapidly at the inflamed parts.

Treatment.—If a horse is suffering from an injury of any kind, the first duty incumbent upon us is to prevent inflammation by removing the cause. The local remedies must be soothing, with complete re-

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pose strictly enjoined. If these preliminary steps be neglected or imperfectly performed, the most energetic remedies may be employed, but they will avail little, as the disease has then got a hold. For instance, in a prick of the foot, you may bleed, purge, and do everything, but unless you remove the cause your efforts are in vain.

The old antiphlogistic theory was bleed, bleed, bleed for everything, and that to an enormous extent. But having already given you my opinion upon the matter, it is not necessary here to recur to it again, —suffice it to say, once for all, that bleeding is opposed to all sound theory.

The next step, then, to be taken is a purgative, as it frees the intestinal canal from all irritating matter. For this purpose, Barbadoes aloes is the best. Purgatives, however, must be cautiously administered; for if we have a case of thoracic inflammation—that is, inflammation of the lungs, or pleurisy, &c.—they are not admissible; but with brain affections and congestion of the liver, with general derangement, it is impossible to over-estimate their value.

The next salutary remedy that possesses extraordinary soothing power, that subdues pain, allays nervous irritability, and is invaluable when given in a watery solution, is opium.

Aconite comes next, but is most useful in inflammation accompanied by excitement rather than pain.

It improves the tone, and diminishes the frequency, of the pulse ; and I have witnessed the most encouraging evidence of its successful action.

Belladonna is another useful agent, but is principally beneficial in allaying irritation attending sore throats.

Amongst the neutral remedies, potassa nitras possesses the power of dissolving the fibrin in the blood, and also prevents the formation of it by the tissues, while it increases the secretion of urine, and assists particularly the expulsion by this channel of the products derived from the destruction of the albuminous materials of the body. It should always be given in large quantities of cold water, as it is then readily taken up by the blood ; but if given in a concentrated form in the animal's food, it abstracts water from the blood, and thus renders it thick, which is not desirable.

Proceeding now to discuss the diseases proper, let us inquire at the outset—

What is Disease ?

Disease may be said to consist of a deviation from the healthy standard, either of function or of structure, or the opposite to health, and is a disturbance of function with alteration of structure of the living organisation. It is also modified in different animals according to their organisation ; while another con-

sideration must be recognised, and that is the peculiar and varied temperament of the different animals. The horse, having a large nervous system, is rendered more susceptible to excitement.

Again, diseases are geographically distributed, some being prevalent in one district and some in another; and animals of the same class, colour, and conformation are more predisposed to disease. They also withstand disease variably: for instance, inflammation of the bowels will destroy a horse in six hours; whereas the same disease will continue for a fortnight in the cow before it produces death.

Here another question arises—How does disease kill or destroy life? Disease kills in one of two ways—viz., either by the suspension of the heart's action, or by impeding respiration: this may take place suddenly or gradually. But nervous influences have a great deal to do with both.

Diseases of the Organs of Respiration.

To understand these diseases aright, it is essential that the reader should know something of the structure of the different organs of respiration; as there is in all the diseases affecting them, a sensibility and sameness in the symptoms which make it difficult at times to distinguish one form from the other. The more we know, therefore, of the structures concerned, the better are we able to follow the various courses of the diseases attending them.

Looking at the chest of a horse, then, you are at once struck with the fact that almost one-half of the trunk is devoted to the purpose of containing those organs whose office and function it is to purify the blood and propel it to all parts of the body, and also those of respiration.

Now the respiration of the horse is more complete and perfect than any other living animal. The chest is peculiar in its construction, as it extends much further back, while the ribs present a much greater range than those of the ox. This is necessary, in order that the blood may be properly and easily purified; therefore it is important that we should have well-developed organs to perform this work, with plenty of room for expansion.

Whenever you have an imperfectly developed chest, you generally find imperfect development of the muscular system. This is well exemplified in man or horse possessing narrow, weak chests. The arms of the former and the legs of the latter are generally thin or skinny, while a half-starved, wretched-looking appearance is the common accompaniment.

In order to secure this properly developed muscular system, we must have a good respiratory system, for by the latter the blood is effectually purified. This is accomplished by the continual motion of the heart's action, which must be considered as the great grand central force-pump of

life, by which the stream is kept in action, and the lungs and body supplied with fuel and nourishment. It is estimated by the contractions of man's heart that the pulse registers seventy-five beats per minute; and every time it thus contracts it propels two ounces of blood into the system, and two ounces into the lungs to be purified and made fit for the system: so that in one minute we have one hundred and fifty ounces sent to the body, and one hundred and fifty ounces sent to the lungs, making in all three hundred ounces of blood that the heart of man propels in one minute.

Now the heart of the horse propels five or six times as much blood as that of man; but there is this difference with our subject, the pulsations are slower, being forty beats per minute, so that we have four hundred or four hundred and eighty ounces of blood sent to the lungs, and the same quantity to the body, per minute—making in all, that the heart propels with unvarying regularity, from eight hundred to nine hundred and sixty ounces. This enormous quantity of blood requires a great amount of vital power in the heart to propel it to all parts of the body; so if this organ becomes diseased, an imperfect flow is the result.

A horse breathes through his nostrils, never through his mouth, unless under some strong spasmotic action. The reason of this is owing to a valve, called the *velum pendulum palati*, shutting off the commu-

nication between the mouth and the nostrils. When a horse is galloping he shuts his mouth close, thus dilating his nostrils. On the other hand, an ox can breathe either through his mouth or his nose.

But all the air a horse inspires must pass up through the nostrils, which are divided into two distinct chambers by a partition called the septum nasi. Both of these chambers or canals are lined with a structure, which is simply a mucous membrane, called the schneiderian membrane. It is very vascular: the blood-vessels in it anastomose one with the other, forming a complete network, among which the mucus follicles are found. These follicles secrete the mucus, so as to lubricate and protect the parts. The numerous blood-vessels in this structure are covered by a membrane called the basement, which possesses no function, with the exception of separating the blood-vessels from the epithelium. This substance consists of a number of cylindrical bodies, upon whose surface there are a quantity of minute hairs waving continually backwards and forwards, keeping the mucus in perpetual motion; so that by this provision the mucus cannot remain in one position, but is moved on *ad libitum*, leaving room for fresh supplies.

At the entrance of the nostrils the follicles are very large, and in health they are always of a deep pink colour, owing to the blood showing through the epithelial layer. It is also very vascular in

this region,—therefore the entrance to the nose is generally made use of in cases of disease, especially those of the lungs, as when they are actually inflamed it becomes of a deep colour, almost scarlet; but when the inflammation assumes the typhoid character, it presents a dull leaden hue. The reason of this vascularity at the entrance of the nose is in consequence of the parts being more exposed to evaporation than those higher up, so that this increase is to be compensated for by the increased quantity of mucus that is required to protect the parts from irritation. It is in consequence of this, I am persuaded, that a horse is more liable to take on or contract disease in those parts than any other animal.

Passing on from this, we come now to the pharynx, which is a muscular and membranous bag, lined on the inside with a thick mucous membrane, and situated at the back of the tongue. This pharyngeal membrane is raised into ridges, because it has both to dilate and contract when the larynx shuts or opens. It is just a continuation of the same membrane that lines the cavity of the nose, but the mucous follicles are larger and more numerous, so that it will be easily seen why in a simple cold these parts are generally affected more or less.

Passing on downwards, we come to the glottis and larynx; the latter being a cartilaginous box, consisting of five separate pieces. These are moved by

appropriate and complex muscles. This organ is always open during respiration, but is closed when the animal coughs, and when the food is passing down the œsophagus.

As we proceed downwards, we come to the trachea or windpipe. This is lined with the same mucous membrane as the parts already described. On entering the chest this windpipe divides into two tubes, which are called the bronchial tubes, the one running to the right, and the other to the left lung, where they again divide and subdivide until they become invisible.

The diseases of the organs of respiration and air-passages are for the most part inflammatory in their nature, which may affect the parts within the nose separately or collectively. When it affects the nose it is called cold or catarrh ; when the pharynx, it is termed pharyngitis ; when the larynx, laryngitis. These diseases may occur separately, but they are as a rule found collectively. Thus in simple catarrh we generally have the pharynx and larynx implicated ; while again the inflammation does not content itself by remaining here, but descends into the bronchial tubes, producing bronchitis : and when it attacks the lung-substance it is termed pneumonia ; and when the covering membrane of the lungs, pleurisy. It is a curious established fact that inflammation always has a tendency to descend, the reason being that the same membrane lines the whole passage.

By an epizootic disease is meant a disease that prevails in a country or certain portions of a country at the same time, and may appear in various seasons. It is the same in nature as an epidemic in man, and those animals that are of a weak constitution are more liable to attacks. In all epizootic diseases the weakest are the first affected; therefore, what benefit can be had from depletion?—on the contrary, we should use every exertion to assist nature to overcome them.

The inflammatory diseases that affect these organs are of two distinct kinds; namely, one which is characterised by high irritative fever—the other, which is of a typhoid or debilitating nature. The former is brought on by accidental causes—over-work, exposure, or twenty different ways; the latter, by epizootic causes, which we cannot account for. At the same time, almost all epizootic diseases are accompanied by fever of a typhoid nature. These are facts not often considered.

The general causes of inflammatory disease in the respiratory organs are, then, simple and typhoid in their nature. The same causes will, however, produce different diseases in different horses: in some, throat affections; others, bronchitis; others, pleurisy; and others, pneumonia. This is due to the varied constitutions; therefore the nature of disease depends greatly upon the animal itself. For example, horses six or seven years old, when influenza or some

such disease is prevalent, will take strangles ; others, again, of the same age, will escape, or contract the prevailing disease in its pure form.

Take another example. Suppose a number of horses from the same stable go out hunting, the next day some will have simple congestion of the lungs, and soon get well ; others are only feverish and nothing more ; while others may have a decided attack of pneumonia, pleurisy, enteritis, laminitis, or founder.

These facts must bring us to the conclusion that there is a dissimilarity of constitution, which so modifies these causes that different effects are the result, for they were all equally alike exposed. Another important fact worth noting is, that young horses have a greater tendency to affections of the upper air-passages than the lower. This is shown conclusively when colts are first put to work—a cause that will not produce this in an older animal. Again, laryngitis and strangles are mostly confined to young animals. In the dog, a familiar example is distemper.

As age advances there is a greater liability of the lower air-passages becoming affected. For instance, a horse that has had strangles is more susceptible to take pneumonia, pleurisy, &c., than one that has not had that disease, though they are of the same age.

Again, whenever diseases of the air-passages and

lungs assume an epizootic form, they become more and more typhoid in their character in proportion to their prevalence. Thus, if only two or four horses be attacked out of every ten, the disease is not nearly so liable to be of a typhoid nature as when it affects every seven or nine out of ten. Where attention is not paid to these rules, deplorable results frequently follow; for some people can see no difference between cases of an epizootic type and those brought on by accidental causes. The symptoms, it is true, resemble each other; but the distinguishing difference is, that one is a typhoid and the other an irritative fever, therefore they should not be treated with similar remedies.

The State of Health.

We must not forget that epizootic diseases always affect those animals that are beneath a certain standard of health, though to all outward appearances they seem perfectly healthy.

The causes of disease may act in one of two ways—that is, directly or indirectly.

Directly.—Any poisonous gas that may exist in the atmosphere acts upon the mucous membranes, causing irritation. This is well seen in a case where the stable takes fire. Some of the horses are suffocated on the spot, while others are got out alive, and die in a few days of bronchitis, &c. Again, take a horse that has been kept in an improperly ven-

tilated stable, the temperature twice as high as it should be. If you take this animal out and allow him to stand exposed to a cold east wind for an hour or so, this will cause him to sneeze, as the cold air acts as an irritant to the lining membrane of the nostrils, the animal being accustomed to impure air in the stable. This will be followed next day by a cough—therefore the cause has acted directly, by the prolonged exposure to the irritating effects of the cold air. The same will occur in passing from cold to sudden heat, the hot atmosphere stimulating the mucous membranes to an increased secretion, thereby causing congestion, which may end in inflammation.

The *indirect* causes are, when an animal has been worked hard all day, perspiring freely, and when going home gets chilled. The hair, which before was lying close to the skin, now stands erect, and the skin becomes cold; the consequence of which is that the blood is driven from the surface of the body into the internal organs, by the constringing of the vessels of the skin, and by the time the animal reaches home a shivering fit attacks him; he now begins to blow heavy and quick,—in short, the lungs are congested. Therefore you see in this case that it is not by the action of the cold air upon the lungs, but upon the skin, driving the blood in undue quantities to the internal organs and overtaxing their strength. All epizootic diseases are brought

on by some peculiarity of the atmosphere, which we cannot explain.

Common Cold, or Catarrh,

is one of the many affections to which the horse is subject. So common is it, indeed, that many people think nothing of it. In our patients the inflammation often extends from the nose upwards, involving the pharynx and larynx. At other times it is solely confined to the nose, in which case the animal only sneezes, and does not cough.

Sneezing is a sudden forcible expulsion of air from the nostrils, so as to get rid of some irritant lodging in them. A case of this description requires no treatment; all that is required is to keep the horse from sudden exposure. The majority of colds, however, are not so easily got rid of; for when we have the nose, pharynx, and larynx affected, it is ushered in by sneezing, which ends in a cough.

To distinguish between a cough in the larynx and one in the chest, requires an intimate acquaintance with the sounds produced. When the cold is situated in the larynx, it is emitted by this organ alone, and there is a certain clearness and distinctness about it that is at once distinguished from the hollow harsh cough coming from the chest. Again, if you pinch a horse with his larynx affected, he coughs immediately on the slightest touch, which is not the case when the chest is affected.

The reason we have a cough is because the mucous membrane is inflamed, it being very sensitive; so an animal coughs to get rid of the irritating air.

Young horses' throats are generally much more inflamed than old ones, for when a young horse is affected, there is usually a thick discharge of matter from the nostrils—so much so, that some people think the horse has got strangles internally and they are bursting. This is not so; neither have we any right to infer that strangles are in existence, unless we have the swelling beneath and between the lower jaws. But in such a discharge the pus is very similar to that of strangles, being of a thick greenish-yellow hue. The throat is sore, the appetite bad, as it pains him to eat and swallow either food or water, and when he does swallow, he will cough after it.

A cold of this kind, as a rule, soon gets better, except it proceeds downwards; so that we are justified in treating it for the worst at the commencement, by arresting its progress without further delay.

Treatment.—The best is to arrest it at once, or as speedily as possible, so as to prevent it descending into the chest. The most effectual means are certainly the soothing ones—hot cloths, steaming the head frequently during the day, and night too, if the animal is valuable. This can be done by taking a pail half full of either nice sweet chopped hay or bran, on which pour sufficient boiling water to well

cover it. Place the pail in a porous bag, so as to admit air, then draw the bag over the face and head, allowing the steam to find its way up the nostrils and round about the throat. When this is done, you should always have a dry hood ready to put on, and the animal otherwise clothed, according to the season. The only medicine that is here required is simply a little nitre in the water to drink.

Laryngitis.

Laryngitis very seldom exists independently of common cold, and when it does we have incessant cough, with little or no sneezing. When the animal partakes of food or water, portions often come back through the nostrils. He will stand with his neck straight out, bending it as little as possible, and he will not be at the trouble to feed either from the rack or ground, because he must move his neck, and this inflicts pain.

Treatment.—The same as a common cold ; careful nursing by hand-feeding, &c.

Now in a genuine case of this kind the cough often lingers behind for weeks or even months, when ultimately it may become chronic, and terminate in the animal becoming a roarer. In these chronic cases blistering has to be resorted to, but it has little, if any, appreciable merit. Medicines that ease the local irritation are useful, but they only palliate it for the time being ; and as those agents might be

further taken advantage of by some men who have little sympathy for such an object as a broken-winded horse, I will leave the matter without further exposure. The reader can construe my reasons for doing so.

Roaring.

Roaring is the name given to that state of breathing in which there is a loud coarse roar uttered during inspiration. In a whistler, the noise is sharp and shrill. Roaring and whistling often depend upon the same pathological condition.

Roaring is a disease that is decidedly on the increase, particularly among thorough-bred horses. It was at one time exclusively confined to the lower-bred animals ; but now some thorough-bred colts are roarers by the time they are three years old.

It may occur in all kinds of horses, with the exception of those under fourteen hands high—they seem to be exempt. If, however, a pony is a roarer, it in general is from different causes. Again, horses in some parts of the country are more subject to it than others. Irish horses, as a rule, are not often roarers. But if there is any county more than another which produces roarers, it certainly is Yorkshire.

Again, horses are more frequently roarers than mares ; and we find roaring in horses of a peculiar form of neck called rainbow. In those cases where

the neck is strongly arched, there seems to be a predisposition to roaring.

Heavy cart entire horses make a noise similar to a roarer when they are trotted sharp or galloped, or when put to work; but this noise is not produced by the cause that roaring is. You will often find that these horses' heads are put on at an acute angle, the neck at this angle being also thick, while the skin is so abundant as to be laid in folds. These horses sometimes roar and at other times not; but a true roarer never improves. When lean, however, they never roar.

What is the pathological condition upon which roaring depends? or, in other words, What is it that produces the noise? Occasionally we find that tumours in the larynx cause roaring or whistling; but five-sixths of the cases of roaring are produced by atrophy, or wasting away of the muscles which enlarge the cavity of the larynx. This wasting is due to absorption of the flesh, and a deposition of fat in its stead. Fat often takes the place of absorbed tissue, while a muscle that has lost its fleshy fibres cannot act; and when this takes place, it will be easily seen that only one side of the muscles of the larynx can act so as to enlarge the glottis. In doing so, it draws the loose cartilage downwards and inwards, lessening the calibre of the tube. The descending air has also the same effect upon it, so that the noise we call roaring is caused by the excessive friction of the

descending volume of air down the constricted orifice, as also by the vibration of the loose cartilage. To illustrate this more clearly, it is just the same as blowing a trumpet where the calibre is all one size—you can produce no sound.

Sometimes the muscles on both sides of the throat are affected, which causes an equal falling in of the cartilages, and we have then whistling as a consequence. Growths on the vocal cords will also produce whistling; a roarer, too, may end in a whistler, although some are whistlers from the first; and so a whistler may be looked upon as an advanced roarer.

Causes.—No doubt the nerves are affected some way or other, although in what particular manner has not as yet been clearly demonstrated. However, if you sever the nerve that supplies motion to any muscle, that muscle immediately begins to waste away. This being an ascertained fact, it must be looked upon with grave suspicion as the cause productive of this disease.

For instance, if one of these rainbow-necked animals have an attack of laryngitis, which leaves him with a chronic cough, it is a hundred chances to one, but he will turn out a roarer, as the part which has been in a state of inflammation for a long time is thrown out of action; and when this occurs, nature is sure to set up absorption in the part.

Again, the frequency of this disease in carriage-horses that have been tightly reined up, has led us

to look upon this practice as another cause. It is easy to see how this produces it: the head being held in an unnatural position must cause a continual pressure, following which absorption takes place as a result. Strangles is another cause, especially in the rainbow-necked animals.

Phlebitis, or inflammation of a vein, is also another cause. In this case, the vein being obstructed, the blood cannot return from the larynx; and as a consequence, nature soon cuts off the supply by the arteries, as she will not send blood to any part from which there is no return. Therefore in all these cases we have, first, impairment of nutrition, and secondly, absorption taking place as a consequence.

Roaring is most unquestionably a hereditary disease; yet some people will not accept this statement. They say that many stallions that are roarers leave behind a sound progeny; but I am of opinion that such an assertion will not bear strict investigation. Some stallions are noted for getting fillies, others for getting colts; while it is a recognised truism that mares are not so subject to roaring as horses.

Again, many a hereditary disease does not manifest itself in all the offspring, because it requires some exciting cause to favour its development; so the first step to be taken in order to root out roarers is to get rid of all the roaring stallions. It is an unsoundness in every form, and incurable.

The next important step is, how to discover a roarer. In doing that, there is not much difficulty in very bad cases, as the cough betrays them at once; but in some it is so slight that it is not so easily diagnosed. You sometimes fail in inducing cart-horses and stallions with thick necks, or old horses, to cough by pinching their throats. This is due to the cartilage becoming partially ossified. In the act of coughing, the vocal cords are brought together, so as to close the larynx upon the inspired air; and when this is suddenly and forcibly let go, a cough is the result: a roarer, then, cannot close his larynx, because the muscles being wasted away, he does not possess this power or control over it. The cough itself cannot be mistaken. It is more like a grunt, of a hollow, deep, churchyard-like sound, and the animal does not blow his nose afterwards. It is a good sign to see a horse clear himself after coughing.

There are various other ways to distinguish a roarer, such as by sudden fright. If you take the horse by the head with your left hand, and make extravagant and threatening flourishes with a stick in your right, he becomes alarmed, and favours you with the characteristic grunt. Again, there is a practical difference between a slight roarer and a whistler.

If the animal is only slightly affected, you will in all probability fail to detect it by exciting a

cough. The best plan then to adopt is a good spanking gallop for ten or fifteen minutes, allowing him to gallop past you. But it is important to catch the horse by the head as soon as he is pulled up, otherwise you may be deceived: and in cases where your suspicion is excited, it is better to ride the animal yourself; when, if you hear the slightest grating noise, you may be convinced that he is either a roarer or a whistler—for in a sound horse all such noise is absent.

It is a vain imposture to offer specifics for the cure of this disease: all that we can do is to avoid breeding from animals hereditarily predisposed, and relinquish the use of the bearing-rein—it is unnecessary, besides cruel to our willing servant. Sometimes we meet with growths causing difficulty of breathing, either on the outside or the inside of the larynx. When they occur outwardly, they can be felt at the side of the neck, and those inside can be felt by introducing your hand into the mouth. In such cases there is no cure, as we cannot cut them away; all we can do is to prevent suffocation (which they are apt to cause), by operating and inserting a tube into the windpipe. This is readily done, and the animal may live for years after, doing useful work.

The Windpipe

is made up of a cartilaginous framework, arranged in rings, numbering from fifty-five to sixty. These are

placed so as to form one continuous tube, extending from the larynx in the throat to the bronchial tubes in the lungs. These rings are thick in front, while they overlap behind. When we look into the inside of this tube, after making a longitudinal section; we find that it is crossed by a muscle, situated in the upper part: its action is to contract the whole of the windpipe. This tube as well as the muscle is covered by mucous membrane, consequently the channel is always smooth and moist; it is also very vascular.

This tube has no very special or active function to perform, but is a passage for the air up and down. The upper and the lower ends of it are very sensitive, but not so the middle. This is proved by making an incision in the centre and irritating it, when it is found that the animal evinces very little uneasiness. On the other hand, if you touch either extremity, great uneasiness follows.

The windpipe is not subject to any individual disease of a serious character, although it no doubt becomes involved along with other complaints.

In most of the lower animals the windpipe enters the chest between the two first ribs, close to the front bone of the chest. When it gets between the lungs it is divided into two branches of unequal dimensions, the smaller going to the left lung, and the larger to the right. This lung being the largest, it is generally supplied by a supplementary branch.

As we get to the lower end of the windpipe, it turns moister, redder, and more vascular. The bronchial tubes possess the same structure as the pipe, yet somewhat modified, as in them the cartilaginous rings are composed of several segments. These segments are attached one to the other by a muscle which runs round them entirely ; whereas, in the windpipe, the posterior part of the tube is only covered by a muscle. On the surface of this muscle, then, we have the common mucous membrane, exactly the same as the windpipe.

Each bronchial tube traverses the surface of the lungs, being slightly imbedded in the pulmonary texture. In the floor of each tube are a number of holes, some single and others double, the upper surface being slightly perforated with these holes, which are the commencement of the secondary or descending bronchia. If we now tear one of these, we find that it in its turn gives off others. These proceed into the lung - texture, giving off other smaller and smaller branches, ramifying throughout the whole lung-substance, until they become indvisible. In fact, there is not a single portion of the lungs that is not supplied with these tubes ; and as they get smaller, they of course are thinner, and far more sensitive than the windpipe. This combined structure, then—namely, the lungs and these tubes—must be looked upon as the cellular apparatus in which the blood is purified.

Bronchitis, or Inflammation of the Bronchial Tubes,

is a common and likewise a serious disease. In some cases of inflammation of the lungs, it accompanies it, and *vice versd.* This is often observed in cases of bronchitis terminating in inflammation or pneumonia, although it may exist as an independent disease, which may be contracted either by epizootic or accidental causes ; and when by the former it is accompanied by intense prostration, while from the latter the prostration is not so great.

In bronchitis the mucous membranes of all the tubes are inflamed, though it seems to have originated in the two primary ones. As a consequence of this inflammatory process, lymph is formed, and sometimes pus, but always a great amount of mucus; while the air passing downwards becomes mixed with it,—hence the frothy appearance which it always presents.

You will now perceive that this collection of fluid in the air-tubes must impede the current of air, and, as a result, the blood cannot be purified as before, which hastens debility. In fact, the strength of the animal depends upon the free passage of pure air into the lungs for the purification of the blood. When blood is propelled by the heart to the lungs, it is for the express purpose of having it purified;

and unless it is purified it stops there: hence it is that we find congestion of the lungs.

Symptoms of bronchitis are invariably ushered in by a cough. Some people are disposed to think that it is natural for a horse to cough, and consequently pay little attention to it; but a horse never has a cough unless there is something wrong.

This cough at first is dry and short. It is dry, because the mucous membrane is dry, but soon becomes hoarse and moist when exudation has commenced. By-and-by it gets rough and painful, then short and frequent; and if you place your ear to the patient's side, just behind the shoulder-blade, you will in the first stage hear a dry sound; but this soon changes to one that is hoarse and rattling, produced by the air becoming entangled in the mucus.

In a healthy horse you can hear the air passing into the lungs, but it comes out noiseless; while in bronchitis the opposite is exactly the case. The respirations now become increased to about twenty-five or thirty per minute; the breathing gets shallow and short, with heavy lifting at the flanks—in fact, in no disease, excepting laminitis and rheumatism, is the breathing so quickened as in this disease. There is also irritative fever, with the pulse soft, quick, and compressible. In the latter stages the ears and legs are cold, the mouth dry and clammy, and the animal stands with his head and nose poked out. There is not much dulness or pain in the chest,

but there is early weakness, which is always the greatest when the disease is brought on by epizootic causes.

Bronchitis causes death, by suspending the action of the lungs, and this is termed asphyxia, or suffocation. The action of the lungs being arrested, the blood does not get purified,—hence we find them congested, or, in other words, loaded with blood. We may have this congestion without the lungs being inflamed at all ; but, as a rule, they are affected.

Post-mortem appearances.—The membranes of the bronchia are reddened, and strings of lymph may be sometimes drawn out of the tubes, resembling the branches of a tree, while the tubes contain a frothy, muco-purulent fluid.

When bronchitis terminates in recovery, it is by a softening of this lymph, which becomes absorbed, —man spits it up ; hence it is that recovery is slow and tedious in our patients. The unfavourable signs are,—pulse increasing in frequency and losing strength, say from eighty to a hundred beats per minute ; the membrane of the nose becomes of a leaden hue, legs deathly cold, ears the same, excessive weakness, bowels irregular, with secretion of urine defective.

The favourable symptoms are,—pulse slower and stronger, cough getting looser, the breathing and lifting of the flanks not so great, the patient gets warmer about the extremities, and looks altogether

more lively, with returning appetite, and the natural excretions taking place.

Treatment.—First, it is of great importance to place the animal in a cool atmosphere, but not in a draught, and clothe the body and bandage the legs. Many horses with this disease will not drink chilled water, so let them have fresh cold water if they will take it. If he is inclined to eat, feed sparingly, as the food in large quantities distends the abdomen, causing injury through pressure to the respiratory organs.

In no disease are purgatives more intolerable than in this one. Two drachms of aloes have been known to kill a horse by inducing super-purgation, especially when the disease has been brought on by epizootic causes. This is owing to the mucous membrane of the intestines participating with those of the respiratory organs.

In accidental causes, administer in water, potass nit., $\frac{1}{2}$ -ounce; antim. tart., 1 drachm. If the bowels are constipated, try to unload them by giving tepid injections, composed of water and linseed-oil. Apply hot fomentations to chest and sides, and support the patient's strength.

When the first stage has passed, and weakness ensues, the following draught may be given with special benefit: tincture of opium, spirits of ether nit., of each 2 ounces. This is to be given three times a-day in warm water. Continue the hot fomentations, hot cloths, &c.

When the pulse reaches eighty or ninety per minute, give the following : Fleming's tinct. aconite, 10 drops ; spirits ether nit., 1 ounce ; tinct. opium, $\frac{1}{2}$ ounce,—thrice daily in warm water.

Towards the third or fourth day a change will be observed, either for the better or worse. In the latter case the pulse frequently reaches one hundred per minute ; the respirations very quick, with incessant coughing. In such a case we find great good from the following, when all other medicines have failed : powdered camphor, extract of belladonna—of each 1 drachm. This should be given every three hours.

When the legs, ears, and breath become cold, powerful stimulants must be employed, such as liquor ammonia fort., or the carbonate of ammonia, with spirits of nitric ether.

This disease may terminate in several ways,—such as recovery, or congestion, or pneumonia, or in thick or broken wind. The latter every one knows by its deep hollow cough. It is owing to a thickening of the mucous membrane in the bronchial tubes, thus lessening their calibre—the treatment of which I must suppress, for horse-dealing reasons.

Congestion.

This disease is frequently brought on in consequence of undue exposure to impure air, or rapid and over work. It often succeeds bronchitis, laryngitis, &c. In this disease all the capillary blood-

vessels are engorged and distended with red blood. This makes the lungs heavier, while they contain less air than their usual supply, in consequence of which their functions are to a great degree impeded.

On a *post-mortem* examination of the lungs, we discover that they are black, owing to the coagulated blood being highly charged with carbonic acid. Sometimes the blood-vessels give way, and then we have extravasation into the texture of the lungs ; therefore the two combined are the most common cause of death, it being produced by suffocation, as the action of the lungs is suspended.

The causes of congestion are various,—so to illustrate one we will select rapid overwork. It is a common occurrence for hunters to die in the field. After the fox has started, some of the horses will not have galloped over two or three fields before they begin to blow. A horse soon after this hangs his head and goes heavy in hand, and if urged on in this state, he is sure to be blown ere he has gone much further. On the rider dismounting, the horse pokes out his nose, and will not be induced to stir. He blows much, the nostrils dilated and injected, with lifting of the flanks—in short, presenting all the symptoms that accompany the first stage of congestion.

Treatment.—In such a case slacken the girths and turn his head to the wind ; let him be led home, placed in a cool, comfortable loose-box, and his body

clothed. Administer a powerful stimulant, in the shape of whisky or whatever is handy, with ten drops of Fleming's tincture of aconite, and in all probability he will need no more. But if, on the other hand, the rider pays no attention to the premonitory expressions of his horse, and does not stop as we have said, the animal will drop, sweat profusely, with intense breathing, even to roaring ; dilated nostrils, elbows turned out, pulse cannot be felt, and often stupidity,—in short, the circulation is almost suspended, while the congestion is so severe that the air-passages are blockaded. In this case powerful stimulants must be had recourse to—brandy, gin, whisky,—every means immediately and promptly adopted, so as to arouse the natural energies. These remedies must be assisted with cool air and hand-rubbing to the surface of the body. To sum up briefly—the treatment is stimulants, sedatives, comfort, and pure air.

Pneumonia, or Inflammation of the Lungs.

The lungs are hollowed out into cells, between which is the proper substance of the lung, in which are the blood-vessels, making the parts very vascular. The seat of this disease is in the muscular walls of the air-cells, with effusion into these cells.

In health the lungs are of a beautiful pink colour, highly elastic, and when put into water they float,

crepitating when pressed between the finger and thumb. In pneumonia things are the reverse of what they are in health. The substance becomes of a red-brown colour, ultimately grey, and when put into water it will sink.

Pathological appearances.—1st, In the scarlet stage there is a period of increased vascularity. This is called the period of congestion, sanguineous engorgement. 2d, When fully confirmed, the lungs are of a reddish-brown colour, and sink in water: this is called the stage of red hepatisation. The 3d and last stage is called grey hepatisation, when it is denser and more solid. These three stages are often found existing in one lung at the same time, and the lowest part of the lung is usually the worst. It does not always attack both lungs at once, and the right one, as a rule, is invariably the one affected first; but in all severe cases they are both implicated. The question may be asked, How does this occur? but it is not easy to explain. The right lung of course is larger, contains more air, and consequently has more blood-vessels. But why it should select this lung first I am unable to explain. It is also the same with pleurisy.

Symptoms.—I may mention, first, that during health the pulsations are about forty beats per minute, and the respirations about ten in the same time. A respiration consists of two acts—that of res-

piration and inspiration. In pneumonia the state of matters is altered,—the respirations are quicker, and the breathing often becomes equal. When a horse takes in air, there is always a pause before expiration takes place; the same takes place in inspiration—we have always a pause first.

Pneumonia is generally ushered in by a shivering fit, which is soon followed by a cold skin, with harsh staring coat. This state of affairs may continue for an hour or two, during which period the blood is collecting in the lungs, as it is driven from the surface of the body. When this has lasted some time the breathing becomes quickened, and when it has got fairly established, the shivering fit passes off; yet the hurried breathing still remains. The pulse in this early stage is laboured and oppressed; and the lungs being over-distended, the blood is improperly purified, while the circulation is tardy and weak. In the first stage, however, we must not expect a cough in all cases. The mouth and skin are hot and dry, owing to the presence of irritative fever; and should this continue for eight or twelve hours, the breathing becomes laborious, and the pulse not only quicker but smaller. The cause of this is, the air-cells being lessened, the blood is imperfectly oxygenated, the appetite is arrested, the kidneys refuse to act, the bowels are irregular,—in a word, general impairment in all the secretions.

Passing on to the symptoms of the second stage, we find the mucous membranes of the nose reddened almost to scarlet, the head poked out, breathing quick and shallow, the flanks heaving laboriously—this is caused by the patient making use of the abdominal muscles, in order to relieve the breathing; the elbows are turned out, so as to expand the chest, the patient sighs frequently, and if there is an aperture admitting cool fresh air, his nose is sure to be poked out against it; the skin is dry, legs and ears cold, and if these symptoms are accompanied by stupidity, the sign is exceedingly bad. A horse in this disease always stands until he dies, or within half an hour of death he may lie down: if he does, it is to die. In recovery it is the same; for he persists in standing for weeks ere he will lie down, the reason of this being that the pressure inflicted upon the respiratory organs causes pain. However, one of the best symptoms of returning health is when he lies quietly down to rest. Auscultation and percussion are frequently made use of in this disease with great advantage, as by them we detect the changes taking place. During the first stage there is an unnatural, loud noise, accompanied with a kind of rushing. This is heard during expiration and inspiration. By percussion we discover the extent of the dulness, thus marking the exact progress the disease makes. Finally, the three stages of the ailment run into one another.

THE DURATION AND SUBSEQUENT PROGRESS OF
PNEUMONIA.

Either for recovery or death, the duration of this disease is shorter than in the human being, in consequence of the inflammatory action being more intense and rapid than in man. If a horse survives eight or nine days, we expect him to recover, particularly if pleurisy is not connected with it.

The unfavourable signs are,—pulse becoming quicker and smaller, running up to a hundred. This is a bad symptom, especially if it continues thus for some days. The breath gets cold, there is torpidity of the bowels and kidneys, stupidity increases, he stands in a corner with his back to the air, the membranes of the nose assume a leaden hue, and on being turned he reels and gives a grunt. Whenever we see a horse in this state, the lungs are filled with lymph, blood, and perhaps pus, extravasated into the texture.

When horses die in this stage, we expect to find the lungs solid, although the three stages are better seen in man,—the reason being that the disease is more rapid in the horse.

Death in this complaint arises from partial absorption of the matter, and suffocation. It is a very serious disease; yet, taking the violence of the symptoms into consideration, it may by proper management be treated with success.

It is more fatal in young horses than in those of seven or eight years old, as in this latter age it is easier to get it under control.

When a professional man is requested to give his opinion in a case that has terminated fatally, he ought to observe carefully the *post-mortem* appearances, as an unskilled person may be led to believe that the disease must have been of some duration. This is important in considering an action raised by a purchaser of an animal that has died from this disease: he is apt to assume that it was in existence prior to purchase. But a horse may die in a few hours from congestion, and in two days from pneumonia.

The favourable signs are,—pulse becoming reduced in volume and beat, the membrane of the nose of a more natural colour, the bowels and kidneys acting, breathing less laborious and quick, an even and equal temperature of the body, with returning appetite.

A horse when recovering from this disease loses flesh rapidly: this is owing to the blood being poisoned by the absorbed matter.

Treatment in this disease is a point of debate, for every one has his own favourite remedy. But if we are tolerably successful with our remedies, we should not be so self-satisfied as not to consider other people's as well.

The first step taken in the direction of cure

must be the removal of the patient into a cool, airy, well-ventilated loose-box. By adopting this plan you promote a sedative action at once. The body must be well clothed, so as to increase the circulation in the skin through warmth—this immediately relieves the pressure upon the lungs. Bandage the legs after they have been well hand-rubbed; and clothe the head, leaving sufficient room for the nostrils, which ought to be sponged out frequently.

Barbadoes aloes, or aloes of any description, must be eschewed—they are nothing short of poison.

Hot fomentations must be employed, and attentively adhered to. It will not do to apply them for an hour or two at a time, then leave off for several hours, and renew them again. When once commenced, they must be faithfully carried on night and day, until a change for the better has set in. Do not grudge your labour or time: you have the inward gratification that you are relieving suffering and mitigating pain, besides the positive fact that your attentive sympathy is registered elsewhere. Let such motives actuate your efforts, and you will never regret having performed a duty incumbent upon you, even though the object of your compassion be a horse.

If the bowels are not acting, persevere with linseed-oil and warm-water injections, one pint of each.

And now as to medicines. Here aconite is of especial value when administered in small doses, as it possesses the power of reducing the pulse and tran-

quillising the patient. The following will be found useful: Fleming's tinct. aconite, 7 drops; powdered nitre, $\frac{1}{2}$ ounce; sp. eth. nit., 1 ounce,—to be given in water three times a-day.

The nitre is of great value, as it acts upon the kidneys, lessens and prevents the formation of fibrin in the blood, and assists in obviating the coagulation that occurs, which is so much to be dreaded.

In cases where the cough is troublesome, calomel and opium, of each half a drachm, are very useful, and should be given in somewhat small doses, and repeated every four hours. There is considerable attention required in the continued use of aconite, as it produces numbness of the limbs; but notwithstanding this, it is a grand agent in the treatment of this disease.

Supposing on the third day the ears and extremities become cold, and the head inclined to drop, with a cough present,—you must now employ powerful stimulants, in order to rally the sinking system. Along with belladonna in half-drachm doses, spirits are the best stimulants that can be employed: their action is more energetic and decided, while they are safer and more easily administered than ammonia salts.

CONSEQUENCES OF PNEUMONIA

are broken wind and thick wind. A man recovering from this disease will amuse himself by spitting

for hours together ; but a horse cannot indulge in this feat, therefore all the exuded matter has to be taken up by the absorbents and carried into the blood, which in turn has to pass it out by the excretions. Hence we often find that a horse recovering from this disease stales profusely. This fact alone proves the necessity of stimulants and diuretics.

Pleurisy

is inflammation of the pleura. This pleura covers the lungs, and lines the inside of the chest. It is a serous membrane, secreting serum, not mucus ; is much thinner than a mucous membrane, and, like it, consists of several parts.

- 1st, We have a layer of epithelial scales.
- 2d, There is a limitary membrane, which is very thin.

3d, The subpleural or fibrous tissue contains no follicles or villi, like the mucous membrane.

A serous membrane has a more mechanical function to fulfil than a mucous membrane. It has to secrete a fluid to prevent friction.

That part of the pleura which covers the lungs is called pleura pulmonalis, and that which lines the inside of the chest pleura costalis.

Now in a state of health the lungs are continually rubbing against the ribs ; but this friction is not felt, as the parts are all kept moist, and the pleura of an

old animal is as smooth and bright as the pleura of a young one.

Pleurisy is a common disease in all animals that we have to do with. We may have it independently of any other complaint, yet it is often combined with pneumonia, and *vice versa*.

It is a disease in which the inflammatory process is very distinctly marked. I think no disease is better defined than this one; and in all cases there is a structural change corresponding to the intensity of the inflammation. When exudation takes place, lymph collects on the surface. This exudation is most copious on the pleura covering the ribs and the diaphragm—sometimes half an inch thick, getting gradually less as we proceed to the back.

Pleurisy mostly begins in the costal region at its lower surface, extending upwards. This disease affects both sides, but has a preference for the right, which is generally the worst. It never causes death in the horse unless both sides are implicated; but cattle frequently die when only one side is affected.

THE MORBID CHANGES.

First, we have the membrane reddened; a small patch on the lower surface of the pleura appears—this expands upwards; succeeding this we have exudation, causing a thickening of the membrane on its surface—the consequence of which is that the pleura looks thick, muddy, and rough. If this is

rubbed off, the redness in the subpleural or fibrous texture is plainly seen through the limitary membrane. This collection of lymph necessarily causes the pleura to be rough, and when they rub one against the other, a sharp darting pain is produced. This stage may be reached in from six to eight hours.

When the disease is prolonged, the exudation becomes more and more abundant, the result being that we have a lot of water collecting in the chest; and as water has always to find its own level, it sinks to the floor, filling up the vacant cavity. The lungs now float upon this fluid; and as it accumulates it prevents them from expanding. An idea may be formed of the immense quantity thus collecting, when I state that twelve gallons of water have been taken from the chest of a horse.

It not unfrequently happens that when a horse is tapped, no water makes its appearance. This is most likely due to the lymph being in great abundance. I have also known cases of pneumonia taken for pleurisy, and thus mistakenly tapped for water, when no water was present.

Symptoms.—First, it may be remarked that pleurisy is far more painful than pneumonia, therefore we have more fever. The reason of this increased pain is because in pleurisy the inflamed parts cannot expand like the lungs, but are put on their full stretch. It is often announced by a shivering fit, caused by a determination of blood inwards. When

this fit passes off, inflammatory fever commences, and the patient commences to blow: sometimes colicky pains are manifested, while at the very beginning we cannot tell whether it is going to be a case of pneumonia or of pleurisy. In a few hours, however, the distinct symptoms show themselves, when there can no longer be any mistake.

There may or may not be a cough at first; the breathing is quick and laboured in a peculiar way, the inspiration rather prolonged or doubled. This is distinctly seen in genuine cases. If they are not prolonged, they will be interrupted and catching,—due to the patient stretching his lungs as slowly as possible, so as to prevent pain.

Then another prominent symptom appears, which is a muscular ridge extending along the ends of the ribs to the flank, while the belly is tucked up. The cause of the ridge is, when the animal is breathing he keeps his ribs stationary,—in short, he is afraid to move them, so the abdominal muscles are brought into action in order to prevent the pain. The pulse is quick, small, hard, and wiry—it seems to throw the finger off the artery, with great irritative fever, accompanied by obstruction of the lungs. These are obvious signs in all cases of pleurisy. In addition to these we have to enumerate others. In the first stage the pulse is about sixty beats per minute; and if you place your ear to the right side, you hear in the very early stage a creaking sound.

In the second stage a rubbing sound is heard, showing that the two roughened surfaces are rubbing one against the other. If you apply pressure between the ribs with your finger, it causes great pain, he turns unwillingly, and in doing so utters an agonising grunt. The legs and ears are not so cold, neither does he hang his head nor look so dull as in pneumonia; but he frequently looks to his side, endeavouring to direct your attention to the seat of disease by touching it with his nose: this is a pitiful look of appeal for help not easily withstood. Again, he stands with his nose straight out. If about the third or fourth day he shows no signs of recovery, we may suspect that lymph is forming on the surface of the lungs, or water in the chest.

If there is a mitigation of the symptoms about the third or fourth day in pneumonia, it is a good sign; but in pleurisy, we frequently find the patient looking very lively all at once, just about this period. The fever and breathing are not so intense; the coat looks better—smooth and glossy; therefore we are apt to be misled. But there is one sign that never deceives us, and that is the pulse; for if the pulse be quicker and softer, the animal is not better but worse. By this time the inflammation has extended to a great amount of surface, and the quickened and soft pulse proves that the vessels are relieved by exudation, which speedily tells upon the system at large. This is the time to make use of your ears, by applying

them to the patient's sides, and noting the different sounds. By-and-by the breathing gets quicker and shallower, the air seeming to go less into the chest ; the nostrils flap, with heaving at the flanks ; the eye looks pearly bright, the skin glossy, with a peculiar wasting away of the muscles over the surface of the ribs.

No one can be deceived by such symptoms as these, even if he pays no attention to the pulse. Every day the exudation is increasing as the disease progresses, until at last we scarcely hear any respiratory murmur at all, the breathing becomes more and more rapid, and superficial dropsy under the abdomen takes place.

On percussion there is dulness as high as the water has reached: in this stage both sides are sure to be affected, so the water will be on a level in either side.

In a cow we often find one side full of water and the other empty. There is also heard a gurgling sound ; but this is not to be relied upon, as we have it in pneumonia. Some authors class it as a first-rate symptom, but it is well known that a sound can never be generated without air in the chest. This may be shown by placing a bell in a jar, when you will be surprised to hear no sound, if you first exhaust the air out of it by an air-pump.

The quantity of water which forms is sometimes

enormous, to the subsequent detriment of the lungs, by pressing them against the spine.

A horse in this disease stands to the last,—when he goes down it is to die.

Favourable signs are,—the pulse losing its wiry tone and getting slower, towards the third or fourth day—we may then entertain hopes of recovery—the breathing getting deeper, and fever less. Often after an attack of pleurisy we find adhesions taking place between the lungs and pleura of the chest, but this does not cause much harm, unless the adhesions are large; at other times collections of white spots are found on the costal pleura.

This disease then, upon the whole, is more fatal than pneumonia, unless we get at it in the very early stage. If it gets beyond that, it is very difficult to manage.

Treatment,—in every way similar to pneumonia. In addition let him have nitre, one ounce daily, in his water to drink. The tapping remedy is a matter of opinion, and I have never seen good results follow its adoption.

When pleurisy destroys life, it does so by copious exudation. If this exudation is only about one-third the depth of the chest, such cases can be absorbed by giving tonics and diuretics; but when the water extends half-way, little more can be done except tapping, which is like a drowning man clutching at a straw.

Influenza.

The term signifies *influence*, from the superstition that it was influenced by the stars. It is a very vague name, as it does not imply any particular pathological disease in horses. But in man the term is restricted to certain symptoms.

It is one of those diseases that are abused to a great extent: for if a horse in the spring or autumn takes pneumonia, &c., it is charged to influenza; and if there is an epizootic occurring in the neighbourhood, forth goes the fiat that it is this disease.

In order to apply the term properly, it should be restricted to certain symptoms. To be as correct as possible in our observations, we may describe the disease as one in which we have a low type of inflammation, affecting the mucous and serous membranes of the respiratory and circulating organs in the chest, accompanied from the outset by a low, sinking, typhoid fever. It embraces the whole extent from the larynx to the lungs and pleura, and even in some cases to the pericardium, the covering membrane of the heart, and even the heart itself.

Pathological appearances of horses dying from this disease.—Beginning at the larynx, we find it black or nearly so, and covered by a frothy mucus, containing not much if any lymph. The windpipe, bronchial tubes, and lungs are literally black, owing to the co-

agulated blood. The lungs are covered with lymph; while in some cases the pericardium is not only covered, but rendered soft. The great distinction between lymph in pure inflammation and that of a typhoid character is, that water is found in the chest, which is often bloody. The heart itself is soft, with patches of blood in it, and has the appearance of being half boiled. The organs in the abdominal cavity are all more or less affected; the liver is soft and offensive; the intestines sometimes injected, with spots of ulcerations upon them,—in fact, the flesh throughout the whole body is soft, and very soon decomposes after death, emitting the most unwholesome detestable odour.

Symptoms.—Well-marked dulness, no shivering fit; the patient stands hanging his head in a corner. A cough is present, which is sore and painful, and at times almost choking; the breathing is accelerated; and in a day or two we have an early discharge of mucus from the nostrils, which is very distinctive of this disease; the mouth is hot and dry; the surface of the body is irregular in temperature, some parts being hot, others cold. We have a small, quick, weak pulse, with general weakness and sinking. Such are the symptoms presented when the surgeon is generally called in.

The next stage is, pulse running up to eighty and small, cough increased, lifting of the flanks, and a ridge running along the sides, the same as

in pleurisy; extreme weakness; if you turn the patient round he staggers; the mouth hot and dry. With these symptoms we must come to the conclusion that there is typhoid pleurisy, and typhoid bronchitis.

The unfavourable symptoms are, great dulness, with very sore throat, extreme debility, incessant cough, quick and weak pulse. As the case progresses, these indications are all aggravated, the pulse reaching a hundred beats per minute, great prostration, with water collecting in the chest, and a frothy mucus in the bronchial tubes, when death takes place from suffocation.

Treatment.—As this is a very serious disease, it must be treated accordingly. In doing so, we must remember that it is quite a different disease from that of simple inflammation; here we have great prostration, so everything must be avoided that tends to weaken the system.

First, then, have a cool, refreshing, airy box provided, with plenty of fresh sweet straw; clothe the patient comfortably, envelop him in hot blankets wrung out of boiling water, and administer Fleming's tinct. aconite, 7 drops; sweet spirits of nitre, 1 ounce; chlorate of potash, $\frac{1}{2}$ ounce,—given in a pint of warm ale thrice a-day. When the cough is very severe give belladonna. But half of the cure lies in careful nursing and attention.

A horse recovering from this disease should have mineral tonics, such as sulphate of iron and camphor, twice or thrice daily. Should a cough remain behind, blister, or insert a seton.

Influenza or Distemper.

This is another form of influenza which is of frequent occurrence, and requires little beyond good nursing, when the animal stands a fair chance of recovery. If, on the other hand, he is neglected, the consequences may be very serious.

It is not particularly a disease of the air-passages, but seems to consist of a low form of inflammation of the cellular tissue and mucous membranes throughout the body, accompanied by peculiar symptoms, totally different from the preceding one already described.

Symptoms.—When first seized, the horse is very stiff, the belly is tucked up, the skin sticking to his ribs, or hidebound, and he rarely moves. Next day the legs become swollen, while there is also swelling under the abdomen, which swelling is infiltrated with a kind of serous fluid; the pulse is a little quick and unnaturally weak; the legs, ears, and surface of the body cold; the animal hardly moves at all, owing to the stiffness and extreme weakness; and all the openings of the body are swollen.

Post-mortem appearances.—On opening a horse dying from this disease, we find under the abdomen a large quantity of serous fluid, mixed with a little lymph; increased vascularity of all the mucous membranes and subcutaneous textures, but not amounting to inflammation. During life the swellings are not painful, for they pit on pressure, showing that the exudation is not of an inflammatory character.

This disease in some districts affects a good number of horses, and is attended with a low typhoid fever. It does not appear to be contagious, but rather of an epizootic nature—the causes of which are unknown.

Treatment.—Clothe the body; place the animal in a cool, comfortable box; allow him to eat any sort of good nourishing food; give mild diuretics, followed up with mineral tonics,—and by such treatment most of the cases will recover.

Thick Wind

is the usual term applied to thick, quick breathing, frequently reaching twenty inspirations per minute. Both the inspirations and expirations are quickened, though in other respects nothing is apparently amiss. Often the pulse is not even disturbed, but the bowels may be irregular, and a cough may be present.

This disease often follows bronchitis, influenza, &c., and may readily be detected by putting the

animal to smart collar-work, or by a good gallop up a hill, when he will blow quick. It frequently ends in broken wind. After death we find great thickness of the mucous membranes of the bronchial tubes.

Treatment.—Sedatives may be given; but the best thing we can do is to endeavour to palliate the disease, which is done chiefly by the liberal use of the best food in small quantities. Water should be given often, and little at a time.

Broken Wind

is applied to a certain state of breathing in which the expirations are seemingly broken, requiring a double effort to perform them—the balance between the two being entirely broken. For instance, the expirations, instead of being the shortest, are about double that of inspiration. Fortunately this disease is on the decline. It very much resembles asthma in the human being; the only difference being that, in asthma, the great trouble is in inspiration.

The *post-mortem* appearances of this disease are very variable. On examining the body of broken-winded horses, we often find well-marked pathological changes. For instance, we often find rupture of the air-cells in the lungs, running along the whole inferior surface, called lobular, and at times interlobular emphysema. It often happens, however, that emphysema is not present in broken wind, therefore it should not be looked upon as the cause, but rather

a concomitant, for it frequently exists when the animal is not broken-winded. Another condition is dilatation of the heart, with disease and enlargement of the valves accompanying it. Again, we often have enlarged liver and kidneys; but why they should be so, I am at a loss to know. Another fact may be noticed here—namely, that, unlike roaring, mares as a rule are oftenest broken-winded. Animals with this disease are remarked to be very often gross feeders. If they were allowed liberty, they would be always eating and drinking; and unless you muzzle them after they have finished their feed, they will attack their litter. There seems to be some peculiar depravity of appetite which is never satisfied; and you will often find, when such animals are old, that they are usually pot-bellied. If, then, you see a greedy-feeding, pot-bellied animal, it is almost certain that eventually he will become broken-winded.

The *symptoms* are very well defined, although difficult when the disease is commencing. A horse may become broken-winded in a few days. It is frequently brought on when the animal is improperly fed, and recovering from chest affections, particularly if worked with a full stomach.

Again, the symptoms may be developed very rapidly, and also very imperceptibly, occupying weeks, months, or years. During this period we have a strange cough, which proceeds from the chest;

it is hollow and deep, not unlike a roarer's. This shows there must be something wrong with the bronchial tubes, by their not contracting, as they ought to do in a natural cough. The animal coughs often in the morning before being fed, and also after drinking, more especially if you trot him directly afterwards. This is as good a way of testing a horse with broken wind as any. In a broken-winded horse there is a cough from the very beginning, which gets more and more hollow, vibrating as the disease advances.

The prominent symptom is the breathing. If the horse is standing quiet, he does not inspire more frequently than in health, but the expirations are double. First, we have a kind of flap, which is followed by the proper expiration. The result of this is, that the expirations are longer than the inspirations, whereas in a healthy horse the reverse is the case. When the animal is put to work, he may do it pretty well for a while; but when he is allowed to stand, the nostrils begin to flap, heaving at the flanks takes place, and the respirations are doubled. Another strange fact occurs in broken-winded animals, and that is, they are continually passing wind per anus. This is more obvious in some than in others; therefore there is every reason to believe that there is derangement of the digestive organs as well as the respiratory.

Treatment.—Some people assert that they can cure

this disease. The writer boldly declares it impossible. You can arrest the appearance of blowing, and mitigate the aggravated symptoms; but to cure and remove the cough, you never can. Seeing, then, that the disease is incurable, I would confer no benefit upon the patient by explaining those remedies that afford temporary relief, as they might be taken advantage of to effect a ready sale and dupe the unwary.

Broken wind is unquestionably a hereditary disease. A mare may bring forth a colt which will grow up perfectly sound, and the same mare again present you with several fillies, all of which may turn out to be broken-winded—some even before they are broken in.

DISEASES OF THE HEART.

In the human subject these affections are of common occurrence, both functional and organic; but in the lower animals they are very rare, particularly organic disease, therefore it will be unnecessary for me to dwell long upon this head.

The reason that we have so many of these affections in man and not in our own class of patients is, that in man many of these ailments are found existing along with Bright's disease of the kidneys and tuberculosis—two diseases that are comparatively rare in the horse.

We do, however, meet now and then with func-

tional disease—by which we mean a disturbance of the functions without any structural change; and by organic we mean that state in which we have a perceptible structural change.

Functional disease of the heart is often witnessed where we have great debility; also in the disease called stomach-staggers, in which the brain and heart frequently sympathise with the stomach, producing the following symptoms: Pulse slow—25 to 30 beats per minute at the most—irregular, and frequently intermittent. By an intermittent pulse I mean one where a beat is left out—for example, thus, . . . — . . . — and so on; and by an irregular pulse I mean one in which the volume as well as the beats are irregular—though in this we have not the same distinct characteristics. When a horse has been affected as above described, and recovers, the pulse regains its natural tone, proving that it is no organic disease.

Again, there is hardly a case of influenza which terminates fatally where the horse has not been affected at the heart; and in most cases of enteritis that continue for six or eight hours, we almost always have an intermittent pulse. The same occurs in colic—especially flatulent colic—indigestion, rheumatism, &c.

On *post-mortem* examinations of the above cases we seldom find any structural change that is important, therefore this ought to be remembered;

for one is apt to conclude that it is a disease of the heart, and treat it accordingly.

In all cases where we find the pulse irregular or intermittent, stimulants ought to be employed: this is certainly the time for them if any is.

With regard to diseases of the heart and pericardium as they occur in man, their nature can be pretty well defined; but in the lower animals, comparatively little information can be derived.

Noticing, then, the pericardium, or the bag in which the heart is contained, we have to observe, in the first place, that it is entirely covered in by the lungs. It does not touch the surface of the pleura or the ribs; and it is scarcely ever inflamed, except in combination with other diseases—such as pleurisy—while it is liable to become involved to a great extent in influenza.

When the pericardium is involved in inflammation along with pleurisy, we find an unusually quick and forcible pulse, with intense irritative fever and distress, accompanied by a friction sound, caused by the exudation in the pericardium. This takes place at a very early stage, so that when the action of the heart is impeded it becomes irregular and less forcible, and we have a dull heavy sound. The reason of this irregular action is that the heart has not sufficient room to expand properly, owing to the collection of water in the bag.

Treatment.—In this disease we must give diuretics

and tonics, with very hot water applied to the sides constantly. No sedatives must be given, as the chief object is to absorb the water.

In some cases of pure pericarditis, where we have a quick forcible pulse, breathing hurried and difficult, great distress, and legs swollen, we may have presented along with these symptoms a peculiar lameness in one or both hind-legs, accompanied with a kind of twitching. Where this is the case, administer a dose of opening medicine, and follow up with calomel and opium.

With regard to carditis, or inflammation of the heart, it is of so rare occurrence that positive assertions are dangerous; so I pass on with the observation that when we have disease of the valves, we have, as a rule, a venous pulse. Cattle, also, are more liable to it than horses.

With reference to medicines, we can do nothing; only keep the animal on good food, allowing small supplies.

Dilatation of the Heart.

This, also, seldom occurs, although the symptoms are pretty well marked. If we place our ear to the sides we hear a loud ringing sound, which is heard over a great amount of surface, and is as distinct at the right as the left side. Now this is an exception which is of importance in diagnosing disease of the heart. Occasionally one observes a horse losing

flesh gradually ; the eyes become unusually bright ; he sweats freely on the least exertion, and will seldom lie down ; the pulse may be irregular or intermittent, and frequently cannot be felt at the jaws. If we place our ear to the left side the sound is heard to be rough ; in such a case the semi-lunar valves are diseased—the right side of the heart being the one generally affected.

Suppose another case, where we have the same symptoms as already given, with the exception that the sounds of the heart are perfect,—in such a case adhesion of the heart and pericardium is generally the cause of it.

Tuberculosis and Consumption

are much more rare in animals than man. Tuberculosis, or that state of the system so called, is rare in the horse, is occasionally found in the cow, and is more common in the sheep. But the two animals that are most predisposed to it are the pig and the dog—the latter when unnaturally fed.

Consumption is a term applied to designate a great waste of the system, with a collection of matter in the lungs, giving rise to what is called tuberculosis. This disease occurs in all climates, while none is more fatal. It is estimated that one-sixth of the population of this country dies from this disease alone.

In the human subject there are certain predispos-

ing signs which point out persons who are liable to this disease—such as softness, flaccidity of the superficial textures of the body,—and one is when we can distinctly trace the blood-vessels, especially the veins; the hair is fine; with small delicate constitutions, accompanied by weakness; large, bright, prominent eyes; nails long, and breaking short;—these are signs that are seldom misunderstood, notifying that tubercular disease is at work in the system.

Tubercles are found in the horse and the cow; but the hog and the dog are pre-eminently subject to them. It is the scourge of all animals brought from foreign countries to ours; and this is corroborated by the fact that the animals in zoological gardens are found to have tubercles in the lungs, although they may have died from some other disease.

Tubercles are said to follow pneumonia, but as yet I do not think there is sufficient proof to substantiate this assertion. People have frequently said that they have detected them; but on examination of the said tubercles, they are found to consist of a collection of lymph, which requires the microscope to distinguish and determine.

In tubercles the collection of matter is of a yellowish colour and a cheesy consistency, and inodorous in principle. They are imbedded in a slightly solidified sac, and when an incision is made, are found to contain a fluid of a granular appearance.

In the centre of the collection of matter we have cells, but no nuclei in them. It cannot become organised, so it generally breaks down and softens, and in some cases becomes absorbed, leaving a hard gritty matter behind.

To distinguish between collections of lymph and tubercle: if it be only lymph, we have cells with nuclei in them—in which case it is distinctly fibrous.

The cause of these tubercles is owing to an impoverished state of the blood, thus giving rise to local exudations in the lungs, which collect in cavities. These at times break down, pus becomes formed, and death is the result.

We have no facts on record that this disease is hereditary in the horse; but I am of opinion that it is highly probable. It is so in man, and there is not the least doubt that it is so in cattle, dogs, and pigs. In North America, Italy, and Spain, it is said to be contagious.

The signs of this disease have not been specially noticed in the horse, but in cattle they are well marked. We have a gradual emaciation of flesh; the coat is rough and strong, and is not changed for a new one, but remains on, giving the animal a dirty appearance; the skin is of a dirty-yellow colour, and appetite precarious; the wasting is very prominent about the neck, which seems sunk down from above, and quite hollow and round below; there is a cough

present, of a deep harsh nature, with swelling under the jaws. When these symptoms are manifested, we may be sure of the kind of disease.

The same indications are seen in sheep and dogs, and no doubt may also be noticed in the horse. In dogs we often see a slight tendency to dropsy accompanying the remainder of the symptoms.

Treatment.—With regard to this, we cannot boast much, although every paper is crowded with specifics. If in the early stage we can lay on a little fat with good oilcake, &c., by all means do so; but a horse or a cow with this disease is not worth the trouble and expense, so the best remedy is to destroy it.

Hiccough, Hiccup, or Spasm of the Diaphragm.

This is frequently caused by an overloaded stomach, indigestion, &c.; but a horse with hiccup is a rare phenomenon, and a person not having seen a case before is rather alarmed.

Symptoms.—He takes in air very spasmodically, producing a flapping sound at the end of inspiration and the beginning of expiration, accompanied by a lifting of the flanks—or, in other words, a sort of jumping up—while the pulse is not much affected. This is the distinguishing feature between it and palpitation of the heart.

Treatment.—A drink of cold water will often cure it, or a dose of tincture of opium, 2 ounces; sweet spirits of nitre, 2 ounces.

Palpitation of the Heart.

The sound this makes is sometimes heard at some distance, and is produced by the heart's action. If we place our hand upon the artery that runs along the spine, we can feel the response so forcibly at times as almost to throw the hand off, while the animal is nearly thrown backwards. It is also of longer duration than hiccup, and the pulse is affected; while it often depends upon debility, not nervous influence as in man.

Treatment.—Tinct. opii is all that is required.

PART III.

STRUCTURAL PECULIARITIES OF THE
STOMACH OF THE HORSE.

THE stomach of the horse is very similar in shape to that of man, and occupies the same position ; but the size is much less in proportion, and it does not come in contact with the front wall of the abdomen like the human stomach. It lies behind the liver ; to the left we have the spleen, and small intestines at the back of it. Owing to this we cannot tell when the stomach is distended, except it be enormously so. Compared with its size, there is no animal with a stomach so small as that of the horse ; and another fact which cannot be overlooked is, that no animal, if left to itself, is so continually feeding as the horse. It is said that, in a state of nature, he daily eats eighteen hours out of the twenty-four. This has been remarked by various authorities, and I think it is correct. It is well known that he eats a great deal more than the ox. Therefore, if he consumes such an enormous quantity, he must either

digest the food very rapidly, in order to allow it to pass from the stomach into the intestines, or it must pass through undigested; and, to be brief, food passes out of the stomach always imperfectly digested. It is simply bruised, softened, and very incompletely dissolved. Thus we find the small intestines, and the commencement of the large, actively engaged in the dissolving or digesting of the food. Then, again, we find that only about one-half of the stomach of the horse is supplied with gastric glands; the other, or the cardiac portion, is supplied with a thick cuticular membrane, the office of which is purely mechanical, to further bruise and compress the food, so as to prepare it for the reception of the gastric juice in the pyloric end of the organ.

This simple texture of the stomach, and smallness of its size, with its other peculiarities, render the organ less liable to disease than that of most animals. Yet, owing to errors in feeding, we find it often affected with disease of a serious character.

Lorry-horses, and animals used for agricultural purposes, are the ones most subject to diseases of the stomach. The simplest affection of this kind occurring in these animals is known by the name of

Indigestion.

This term is often vaguely employed in the horse. It is applied to an imperfect action in the stomach and intestines, but, correctly, should be limited, as

in man, to affections appertaining to the stomach alone, and under this head I will describe the disease.

It is a state of the stomach in which we have an unnatural digestive process, arising from a variety of causes.

Symptoms.—The coat looks bad, pulse and breathing natural, thus showing that nothing is wrong with the organs of circulation and respiration. If we inquire a little into the case, we find that he does not drink a large quantity of water. If it were so, we might reasonably suspect diabetes. The animal is hidebound and feeds badly; he prefers his litter or any other kind of rubbish to good well-got sweet hay; while he is continually licking the wall picking up earth, mortar, or anything he can get hold off. This proves that there is some unnatural burning heat in the stomach—in fact, it is exactly similar to heartburn in man. Combined with these symptoms we have eructations of gas, while he perspires freely. If this is allowed to go on, he becomes unable to work comfortably; and if no notice is here taken, profuse staling or diabetes succeeds, when he becomes very thirsty, and the tongue is constantly licking the wall. This state of matters may be produced by a variety of things, such as overheated hay, kiln-dried oats, &c.

Treatment, in the first place, should consist in a total and complete change of feeding. For example,

if upon dry hard food, substitute green if possible ; and if upon green food, change to dry.

In a general way medicines are required, as the bowels are usually irregular ; therefore give a mild dose of physic—say Barbadoes aloes, from 4 to 6 drachms. When this has ceased to operate, give agents to neutralise the acid, for which purpose any alkaline remedy will do. One that is always in every household—namely, the carbonate of soda, given in water—will be found sufficient.

Vomiting

in the horse is of rare occurrence, though now and again we do see cases of it. When a horse vomits, it is through his nose, and it frequently comes on after coughing, or is produced by irritation of the cesophagus (or gullet). It is so seldom seen, that many go even the length to deny it, and therefore will not accept it. But it is a fact well authenticated.

In such a case tonics and sedatives should be given.

Stomach or Sleepy Staggers.

It is called stomach-staggers, because it depends upon a filling of the stomach tight ; and sleepy staggers, because the brain seems to sympathise with it.

This disease consists in an unnatural distension of the stomach with gas, and by hard, indigestible food ;

it has been known to be engorged to such an extent as to make it even four or six times its natural size.

In making *post-mortem* examinations of animals that die of this disease, we find as a rule that the stomach is ruptured, in which case the food gets into the peritoneal cavity, and, as a consequence, death ensues. The inferior curvature is the part generally ruptured, and in many cases we do not even find a trace of inflammation. Then again there are some cases in which the intestines are filled with food, and they frequently burst as well as the stomach. But the distension of the latter organ predominates, and marks the disease. We have also many cases of rupture of the intestines, without inflammation being present.

This disease is caused by eating an enormous quantity of food—as witnessed when horses break into a wheat or barley field, &c.; or from eating uncrushed oats, barley, or anything in over-abundance which has a tendency to overload the stomach—indigestible fermentative food particularly so; or by giving a large feed of oats, and allowing the animal afterwards to drink as much water as it pleases. Before starting work it is sometimes quickly developed.

Symptoms.—It is ushered in by uneasiness—the animal walking round the box and perspiring. When these signs supervene, the intestines participate in the disease. If he gives evidence of abdominal pain,

this is manifested by the animal looking round to its flanks, with the pulse unnaturally slow—twenty to thirty beats per minute. As the disease progresses, he stands in one corner, resting his head either on the manger or the wall—in short, he appears perfectly senseless. The pulse continues slow and oppressed; there is little blowing, but a profuse sweat breaks out between the legs; the pupil of the eye becomes dilated, and through time, in severe cases, he often turns completely blind. He may remain in this sleepy condition for several hours, during which he has a secondary attack of pain, yet still he cannot see. In most cases he will walk round the stable or box in a circle, and by this time the intestines are involved. Supposing the animal to get worse, he sweats more, the pulse becomes quicker, the pain is increased, and eventually he will lie down and struggle, while fluid will be dribbling from his nose: these are the worst appearances we can have. The eyes are now blanched, he attempts to vomit, sitting on his haunches, reaching out his nose, and contracting his lips. These are evidences that cannot be mistaken in guiding us to the unwilling conclusion that rupture has occurred, and in such a case death soon ends the scene.

The favourable signs are,—swelling decreasing, the bowels and kidneys acting, and altogether the animal looking more lively.

Some people say that this disease is owing to the

torpidity of the brain, causing the animal to eat so much food without any consciousness of what he is about; and under this impression they bleed to relieve the brain.

I do not coincide either with the opinion or the bleeding—because, in the first place, it arises from the stomach being affected, and becoming paralysed by the enormous quantity of food; then the brain becomes affected as a consequence, owing to there being a channel of communication between the stomach and it. The distended organs then press against the lungs, hence the blood is improperly purified, and when this is reflected on to the brain we have the result.

Treatment.—Bearing these facts in mind, how should we proceed? You have seen that the cause is located in the stomach and intestines—therefore remove the cause by giving a good dose of physic. This may be followed with stimulants, such as whisky, &c., when the pulse is low. Give agents to neutralise the gas, hand-wisping the belly; or better still, have a stout pole with a rug rolled round it passed underneath the abdomen, and let a man take hold of an end each, and rub backwards and forwards. This is the best way to apply friction, because you can graduate the pressure to suit the cases.

With reference to bleeding, I have only to direct attention to the fact that the blood is not the cause, therefore you do not in one single instance afford

any benefit by its abstraction; on the other hand, for the sake of contention (and there is too much of this prevalent), admitting that the blood is bad, do you think that by general blood-letting you can separate the good from the bad, when both are so intimately blended together? We should recollect how long the blood takes to travel from the heart to its destination and back; and seeing the short time occupied before it is again returned into the heart, it is impossible to extract the bad and leave the good. By bleeding, then, you reduce the strength of your patient, and lessen the likelihood of his recovery. Your endeavours must be concentrated upon the bowels, in order to get them into action; and when this is accomplished, you are justified in predicting a favourable termination.

When rupture occurs, nothing can save. An unusual quantity of food eaten does not always produce stomach-staggers, but often what is known as founder, inflammation of the feet, or laminitis. This occurs oftenest in hackney horses and suchlike. In fact, the same cause in different animals produces different diseases; for where a number of horses break loose, and all partake of the same sort of food to excess, in some we will have founder, in others staggers, and so on.

This disease follows irritation of the bowels, enteritis, or accompanies a dust-ball. There is yet another kind of staggers affecting the horse, called

Grass-Staggers.

This kind is of frequent occurrence among horses about the latter end of July or the beginning of August, and often affects all the horses on a farm. It is due to the grass, and not, as some suppose, to the state of the weather, for it will occur whether hot or cold. It occurs where the grass is hard and woody, instead of being succulent, tender, and young. It is often met with in horses that are fed upon vetches or tares; indeed, so common is this disease with this kind of herbage, that the two stand in relation to each other as positive cause and effect—while the symptoms to the uninitiated point in the direction of the brain, and if treated accordingly, it will be without success.

Post-mortem appearances.—The stomach and large intestines are packed with hard, indigestible food; the membrane of the stomach is congested; while the brain is more or less in sympathy, extending in many instances to the spinal cord—the bowels also being congested and affected.

Symptoms.—These are similar to what are seen in stomach-staggers, but somewhat modified, as we seldom see such stupidity and blindness in the same period of time. The other symptoms are longer in making their appearance, and last longer when they do appear. Sometimes it requires days before they are developed, and have been known to last a week

or two. The horse reels about, particularly with his hind-legs, seeming to lose all control and command over this region—in fact he appears as if his back was broken, or very severely injured. Still the fore-legs are little affected: he also urinates and dungs. There are, however, one or two distinguishing proofs by which we can recognise it from the other form of staggers—viz., by it generally occurring when the grass is old, and by a number being seized at the same time in a similar way; and especially when we have the reeling gait of the hind-legs, rest assured that it is stomach grass-staggers.

The majority of cases recover without much trouble, while others end unfavourably. When the animal has had it for a week or so he gets down, becomes very restless,—succeeding this, blindness sets in, and ultimately death.

Treatment.—In mild cases the diet should be changed, and that which tends to open the bowels substituted, such as bran-mashes, &c.; but allow nothing that the animal has been in the habit of eating.

A horse with this disease will often eat as much as any other animal, the reason being that he does not appear to know anything ails him.

Then, again, there can be no question as regards purgatives, as they hasten the evacuation of the cause. Many bleed, and attribute their success to this; but if they had not administered the physic,

death would have seconded their efforts by the removal of the patient. After the aloes have cleared out all the effete material, mineral and vegetable tonics must be administered: Powdered sulphate of iron, 2 drachms; powdered gentian-root, 2 drachms; powdered ginger-root, 2 drachms. Mix, and give one night and morning. In a few days after the above treatment, the reeling gait will begin to disappear, and depart gradually, provided the bowels are kept open.

Again, the symptoms continue longer in old horses than in young, and when this is the case, you cannot do better than turn them out on a good short pasture. This has cured when medicines have failed.

Strychnine has been employed with marked benefit when the reeling gait continues; but this had better be administered by a professional man, knowing its action and watching its effects.

Gastritis, or Inflammation of the Stomach.

There cannot be the least doubt but that this organ is liable to inflammation, although in the horse it is generally accompanied by inflammation of the bowels. But, after all, the symptoms are much alike, therefore they should always be considered jointly.

In man, dog, and pig, gastritis occurs as a distinct disease.

Enteritis.

There is no disease which destroys life more rapidly than this one, and happily so for its victim.

The small intestines are mainly concerned in assisting the solution of the food, and promoting absorption of the chyle; the large intestines retard the food until it has given up all the fluid that can be taken. The small intestines are subject to some diseases which do not affect the large, and the large to some that the smaller are exempt from. All the intestines possess three distinct coats. The internal or inner is the mucous, the middle is the muscular, and the external or outer is the serous. The internal coat is the most vascular of the three—that is, it contains more blood-vessels. Now, when inflammation affects any of these coats in the intestines, it is called enteritis.

From experience we find that the internal coat is the one most liable to inflammation, in consequence of its vascularity, and from the position it occupies, it being the only coat that comes in direct contact with the food. The middle or muscular coat is the only one affected in spasmodic colic, but the external may become implicated.

In some cases we have the walls of the abdomen involved in inflammation, constituting peritonitis. Again, in inflammation of the mucous membrane of the intestines, the large ones suffer oftenest. The

large intestines are, in proportion to the small, at the rate of about five-eighths of the former to those of the latter.

On the other hand, when inflammation affects the peritoneum, it as a rule implicates both large and small intestines. This is well exemplified in disease after castration. There are some intense cases, in which the small intestines are so affected that the stomach participates in producing gastro-enteritis.

On some farms enteritis is a most fatal and disastrous disease, and one that the farmer has good reason to dread. It is most common in heavy horses, and seems to select the best in the stud as its victim.

The causes that produce it are more numerous and irregular than any other complaint I know of, while its rapidity will destroy life in six hours from its attack. The reason of this great fatality is, that in the majority of cases remedies are not had recourse to at the outset; and the result is, that before help can arrive, it has become firmly established, when the most energetic efforts to arrest it are expended in vain.

Post-mortem appearances.—The whole of the internal surface of the large intestines is inflamed. This inflammation is of a peculiar character, the internal coat being covered to the thickness of half an inch with coagulated blood, arising from rupture of the blood-vessels. When this layer of blood is

removed, we come to the true membrane, which we find is raised up and separated from the other coats ; while the muscular coat is sometimes turgid with blood as well as the peritoneal coat, though this is not always the case.

The large intestines alone are about 30 feet long, and the small about 70. The colon, one of the large bowels, is in one part as large as the stomach. Therefore it may be easily perceived, that if we have this great extent of intestines all inflamed at once, it will soon terminate a horse's existence.

In some cases of recovery we notice the droppings covered with blood for a week after—ay, even for a month they remain tinged. After death the food is tinged also. This black, bloody appearance causes many to say that mortification has taken place. But this is not so, as it is simply the characteristics of inflammation occurring under peculiar circumstances.

Causes.—These are very various. The same causes that were in operation, as we have already noticed, to produce founder, stomach-staggers, &c., will produce enteritis. It generally results from an animal eating a large quantity of food, and being allowed to drink a large quantity of water afterwards. And here permit me a slight digression. It is customary in farm-places to feed the horses in the morning first, and then allow them water on their way to the plough, or as soon as they get out of the stable. This prac-

tice is bad, and offers every inducement to an attack of indigestion, which may end in enteritis. Why farmers are so indifferent to the ordinary laws of health, I cannot explain. But I embrace this opportunity of laying these facts before them, and trust that they will, upon mature consideration, see it to be for their best interests to amend their practice. The water washes the undissolved food through the small intestines into the large ones, where it collects, and thus acts as a foreign body, for the simple reason that it has not had time to become properly digested. This, then, acts as an exciting cause, and inflammation is produced. In the first instance, it commences in a very small patch, but soon extends, if allowed; and rapidly completes its work.

Another cause is, giving cold water after over-work, when the animal is yet perspiring and blowing. In this case the cold water paralyses the action of the intestines, the animal being overheated, thus preventing the assimilating process of nutrition from going on.

Symptoms.—These are some time in coming on : the horse will be very uneasy, dragging his legs under him, and will continue in this cringing attitude for some time, say half an hour ; after which he begins to breathe quick, and the pulse increases in motion, at first not large, but gives a firm sharp beat of about 55 to 60. This kind of artery, accompanied by the hurried respirations, shows us the presence of fever.

The cringing may or may not disappear, but he will walk round the box with his nose to the ground,—at other times he is still; he feels pain, though not of an agonising kind, and draws his legs together, comes down and fights violently; he rolls over upon his back, and with a bound is on his feet again. Then as the disease advances, he is up and down continually; the breathing becomes quickened in proportion, while sweat pours freely from the inside of the thighs and between the fore-legs: as it increases the pulse becomes more and more hurried—say 80 or 90 per minute; he gets weaker as he gets worse, the eye turns more or less insensible to light, and before he dies the artery is intermittent.

The unfavourable signs are, a strong and violent quivering of the muscles of the neck and shoulders. Sometimes this extends over all the body, and is accompanied by a saturating sweat. By this time he is frequently blind, sitting upon his haunches, and making attempts to vomit. When this is noticed, we may be sure that rupture has taken place; there is excessive prostration; in some cases he will stand, and when he lies down it is to die.

The majority of animals seized with this disease never recover, as there is a very large amount of intestine inflamed, with copious extravasation of blood on its surface.

Before leaving the symptoms of this disease, I

would say a word or two in regard to constipation and purgation.

A statement is made by several writers that constipation accompanies this disease when the peritoneal and muscular coats are inflamed, and that when the mucous coat is affected, purgation ensues.

Now this statement we cannot accept, for in opening the bodies of animals that die of this complaint alone, we are astonished to find that the effete material ready to be evacuated is thoroughly prepared, but notwithstanding all our efforts, it still remains. This is owing to the inflammatory action suspending the natural function of the intestines ; which is reliable evidence whether the inflammation affects the one coat or the other.

In the great majority of instances, none of this effete refuse is voided for some time before death. There are a few cases, however, ushered in by purgation, especially when brought on by drinking cold water, &c. ; but as the disease advances, the action of the bowels ceases.

In this disease never entertain false hopes by expecting recovery : use your best means and exertions on the patient's behalf, and if things turn out better than you expected, you will be agreeably surprised.

Treatment.—It is important to recollect that we have an acute inflammatory disease, which invariably severs the thread of life in half-a-dozen hours, and that it is accompanied by a vast amount of nausea

and sinking; hence early treatment is the only safeguard. These facts should ever be borne in mind.

Bleeding in this disease—pure enteritis—hastens death sooner than any other, therefore the first step in the right direction is to give a purgative, because the bowels must be relieved as soon as possible. For this reason it is better to dissolve the aloes, and give the following in solution: Powdered aloes, 6 drachms; linseed-oil, 1 lb.; tincture opium, 2 ounces. Two eggs beaten up in this form a capital emulsion. Injections should be frequently given, composed of a little linseed-oil and pure water, but on no account permit the introduction of soap. What we require is soothing, pacifying agents, to allay the pain and prevent the spreading of the inflammation; and if there is anything more opposed to a successful issue in the treatment of this disease, it certainly is soap-injections.

In order to effectually test the irritative properties of soap, you only require to allow a little of the water in which you wash to penetrate into your eyes, when you will painfully discover that it is not long in effecting inflammation. What must it then be, administered per rectum, in a thick, foaming, livery state, into the bowels of dumb animals? I have often been horrified at such cruelty being perpetrated. No wonder the poor tortured patient throws

himself violently to the ground with these paroxysms, and dashes his head against the ground or the wall, while no pen can adequately describe those agonising struggles. Have plenty of hot water continually applied. Envelop the patient in blankets, and pour the water on as hot as he can bear it. You cannot estimate the value of this grand soothing remedy. Would that it were oftener had recourse to! However, on no account lose your first, your best, and only chance by its immediate application,—not relinquishing your efforts until the pain is subdued and the prominent symptoms modified.

Give also large doses of belladonna and opium, with frequent small doses of Fleming's aconite. If the patient will drink, let him have a good quantity of nitre in the water, which should be administered if he refuses to take it at will.

When the second stage has arrived, with the pulse weak and quick, if you think that blood has extravasated on the surface of the intestine, you should administer powerful stimulants.

After-consequences.—Death is the most common issue of acute enteritis. Another is acute founder. In such a case they do not, generally speaking, do very well, and the only thing we can do is to keep the feet cool with cold bran-poultices: attend also to the patient's comfort otherwise, and keep him perfectly quiet.

Constipation.

We often meet with cases of this kind, which will continue for several days. The disease is generally accompanied by pain, and a slight degree of fever, making its approach something similar to colic, but lasting a much longer time. If there is inflammation, there will be fever, with a quickened pulse, and the reverse if such is not the case. At the end of four or five days the bowels begin to act, when the animal may be pronounced safe.

Another kind of constipation arises in consequence of foreign bodies lodging in the intestines—the colon, one of the large bowels, being the principal habitation.

Millers' and bakers' horses are the most subject to dust-balls, or horses fed upon dry food. There are two kinds which obstruct the excrements from the body,—the one being the dust-ball proper, made up of the fine downy substances attached to the end of oat grain and other *débris* of the ground corn, &c.; or it often happens from a small stone, or piece of wood or rag—anything that forms a centre around which the material collects. The other variety is called calcareous balls, in consequence of being composed of almost entirely calcareous matter: they are long in forming, and have generally for their nuclei a nail or other foreign body.

Now a horse may live in apparent good health for

many years with a dust-ball, when some day he will have an attack of colic, which soon passes away. These attacks, however, will become of frequent occurrence, while each is more severe than the preceding one. When they appear without any justifiable cause, we have substantial reason for suspecting that the formation of one or other of these bodies is taking place. At the beginning of the attacks, no man can positively assert that they are in existence; but when oft repeated, it is a sure sign that there is some foreign body in the intestines.

The symptoms of abdominal pain continue over two or three days—becoming gradually longer and longer in their duration, with the action of the bowels suspended; towards the third or fourth day the symptoms get more intense, the pulse quicker, and, in short, all the manifestations of mild enteritis appearing. He lies upon his side, stretches out his legs, perspires a good deal, sits on his haunches, and makes frequent attempts to stale.

With regard to the last symptom, permit me to say a word ere I close this subject. It is a popular idea that frequent attempts to urinate are conclusive proofs that something is wrong with the kidneys, bladder, or some of the urinary organs, which requires to be relieved. But this is altogether fallacious and misleading; for such symptoms are merely manifestations of pain, and as such must be accepted for what they are worth.

A dust-ball or calcareous ball usually destroys life by plugging up the orifice of the intestines: this gives rise to inflammation of the mucous coat, while often the three coats are involved.

Treatment.—You may employ all the remedies that can be resorted to—eventually the ball causes death.

Colic

is of two kinds, distinctly marked—one flatulent, the other spasmodic. Of the latter, spasm of the muscular coat of the small intestines is one of the most common diseases to which the horse is liable. It is easily relieved, and often disappears of its own accord. Its attack is always sudden, and without fever. During the paroxysms he dashes himself about, regardless of any injury he may inflict upon himself: the pulse is not much interfered with, except when the spasms are on, when it runs up to about seventy per minute. After the spasms subside, the pulse resumes its normal condition: this is a noteworthy symptom, and one you will do well to remember. When the abdomen becomes distended with gas, it is then termed flatulent colic. In this case you never have the cessation or modification of the symptoms in the same manner as you have in spasms; the pain is constant, while the pulse remains about sixty or so per minute.

Treatment.—Give a dose of physic first; this is always a safeguard, and one that should never be

neglected: follow up this with opium, and, as a rule, you have a successful termination.

Peritonitis,

properly speaking, is inflammation of the peritoneal membrane which lines the walls of the abdominal cavity, while it frequently extends to that which forms the external coat of the intestines.

True peritonitis is a rare disease in the horse: it is oftener met with in the cow. There is, however, one condition under which it occurs more frequently than others, and that is after castration.

In peritonitis we have inflammation of a fibro-serous membrane, therefore there is a high degree of irritative fever — much more so than there is in enteritis, although not so rapidly fatal as that disease.

It is commonly said that the symptoms of these two diseases are alike; but this is not so, unless you classify them under that head when the external wall of the intestines is inflamed, as is usually the case. On the other hand, this cannot be designated true peritonitis, as this disease presents its own special symptoms.

Symptoms.—We have fever and restlessness, but not that constant up-and-down sort which characterises enteritis. He strikes his abdomen with his feet, walks round the box smelling the ground, but does not lie down, as this would entail extra pain. There

is the usual quick strong pulse. As the disease advances, the respirations become quick and short, with increased perspiration; there is straining and stretching, as though he wanted to get rid of something from the bladder, and intense pain on pressure with the hand.

Treatment.—Hot fomentations must be applied at once, and continued without stoppage. Give a good dose of physic: this is of special value, as, when it has operated, it lightens the load of the intestines and increases the excretions. Follow up with opium, aconite, and nitre. Injections should be given, and everything done that is possible,—never forgetting that, unless you steadily persist with the hot water, those medicinal agents will in themselves prove utter failures.

When it follows castration, it does so in certain seasons, and several will perhaps die from peritoneal inflammation—particularly when east winds prevail. Suppuration does not take place, and in consequence the inflammation extends up the cord into the abdomen. This occurs about the third or fourth day after the operation. The animal stands dull, hanging his head, while the breathing is quickened; he will press his tail against the wall with considerable force; the pulse is quick and small, accompanied by the tendency to go backwards; there is high fever; no appetite,—when death ensues about the fourth or fifth day, according to the rapidity of the symptoms.

Post-mortem appearances.—On opening the body we find that the inflammation extends from the cord to every surface of the peritoneal membrane.

Liver Disease.

The liver of the horse is very rarely affected, or rather diseased, in comparison with that of man. The only reason that I can assign for this exemption is, that our patients are not in the habit of indulging in those deleterious mixtures that now elevate, again depress, and finally arrest, suspend, or destroy the complete complex functional system of the living organisation. There can be no doubt whatever that it is owing to this fact—namely, immutable regimen. It seems, however, to occur in hot climates; for it is asserted that horses are affected with a profuse purgation, which is attributed to the liver. It is called molten grease, and is not accompanied with much pain or fever. This statement I would advise to be cautiously accepted.

Treatment.—Stimulants and sedatives.

Inflammation of the liver is very rare, unless in conjunction with other diseases.

Disease of the Spleen

is also very rare in the horse. It is, however, now and then enlarged, but the symptoms vary; the animal wastes away—the belly becoming larger than natural.

Strangles.

The disease we call strangles evidently consists of a peculiar inflammation of the lymphatic glands between the sides of the lower jaw, in the neighbourhood of the pharynx and in connection with the larynx. The inflammatory process goes through a sort of definite order of symptoms, and in the end generally terminates in suppuration of the glands underneath the jaw. It is a very interesting disease in a variety of aspects. There is no disease in man identical with this one, and I never saw it attack the same horse twice.

There is a kind of inflammation which affects the submaxillary and sublingual glands of horses almost every year; but this is not true strangles, only a sort of severe cold, with cough and sore throat.

True strangles is a disease that seems to affect most young horses, but not all: those that escape do so from causes we know little about. It generally affects them when brought into the stable for the first time, so that it consequently attacks animals two or three years old. Race-horses have been known to have the disease earlier than this.

Causes.—Nothing satisfactory is ascertained concerning this disease: some people say it is contagious, while others maintain that it is not. There is evidence to support either contention; but I am of opinion that an animal must be predisposed to con-

tract it, and that these influences or conditions will accelerate its development. For example, take half-a-dozen colts from the grass, put them into a stable for twenty-four hours, then turn them out again, and they will invariably contract the disease in a day or two.

Symptoms.—It is usually ushered in by a catarrhal affection, sore throat, cough, and a discharge from the nose. In three or four days the animal will have difficulty in swallowing: the food in many instances is returned through the nostrils, while at other times we have symptoms of choking. It is said that the disease begins under the jaw; but this is scarcely correct, as it commences in the neighbourhood of the larynx, the small glands here being the first inflamed. In a day or two more a swelling is seen under the jaw, which is flat and diffused. This generally occupies the hollow space, filling it up completely; it is painful and hard, while you cannot move the skin over it. In all cases of bastard strangles the tumour is small, not diffused, while the glands are affected singly and individually—in fact they are knotty. But in true strangles the inflammation affects the glands as one whole mass, with a plentiful discharge of matter from the nostrils, which is liberated from the small glands further back than those that were first attacked. The tumour under the jaw comes to a head in the middle line, or a very little to one side; whereas the tumour in bastard strangles bursts at the

one side. The animal seldom feeds very well, in consequence of the sore throat and glands. Those cases of strangles always do best when the tumour suppurates freely, plentifully, and early; and the reverse when it does not.

The most common termination of this disease is recovery. A slight cough may remain for a week or ten days, when it passes away. Again, it generally seems to do best when colts are feeding on green food, and when they recover, they lay on flesh very fast. Another termination of strangles is the formation of abscesses in different regions of the body, and is called irregular strangles, signifying that form of the disease which does not produce an abscess under the jaw.

You will sometimes find a colt suffering from symptoms of catarrh, and if you feel his throat, you will discover a lump, when you will naturally conclude that he is about to take strangles. Upon examination next day, you will be surprised to find that the previous evidence has disappeared, and you begin to think that you have been deceived. But in a few days the coat begins to stare, the animal has a difficulty in swallowing, while the lump has returned. When this is the case, it is no use thrusting in a lancet at this stage. These irregular cases are longer in recovery than the others.

In the other case, instead of a tumour forming, the colt gradually wastes away: he coughs frequently,

although not in all cases, and the pulse is irregular. In this instance it is very likely that the tumour is forming in the mediastinum, when we often have symptoms of choking.

Then, again, the heart's action is not always affected, but we have the abdomen tucked up instead. In this case it is likely that the tumour is forming in the mesentery; but it is impossible to tell in every instance where it is forming. Under those circumstances all we can do is to support the animal with the best of food, and leave the rest to nature.

Treatment.—This is of special importance,—so neglect or want of attention will not do, as it is a debilitating disease, and requires a great amount of pus to be formed; therefore it is imperatively essential that the patient receives the best nourishment that can be provided.

If the season of the year will admit, allow a liberal supply of green food, with beans and oats. The colt should be kept in a moderately warm place, well ventilated, while his body should be clothed according to the season of the year. It may be observed that the abscess has been sent back by a change from warmth to cold, so every care is necessary in the nursing department.

For this disease we do not require to be for ever administering drugs. Keep the bowels open by regulating the diet; faithfully apply hot fomenta-

tions to the head and throat ; and with a moderate use of nitre in the animal's drinking-water, this will very often be all that is required.

Should a cough remain after the abscess has burst, discharged, and healed, a blister applied will have the desired effect of removing it.

Glanders

is a disease of a malignant and suppurative character, which occurs more frequently in the horse than in any other animal—in fact it is a disease peculiar to the horse, except when other animals become inoculated.

This disease is readily produced in the human subject, as there seems to be a great tendency to favour its development.

The name glanders has arisen from the fact that in bad cases the glands under the lower jaw are enlarged and sometimes ulcerated. The disease has been known from time immemorial, as we find it in all the old works of farriery, both in this country and on the Continent. It seems to have been more prevalent at one time than it is now. But it nevertheless still exists ; and is generally found where bad stabling, bad management, and other causes predominate.

ACUTE AND CHRONIC.

This distinction is a proper one to employ, as we often find horses suffering from glanders for a year

or more without undergoing any material aggravation: this kind is termed chronic glanders. On the other hand, we frequently see cases which begin and end in five or six weeks: this is the acute form, and has been known to prove fatal in a couple of weeks. Such cases as these are seldom brought on by inoculation, but generally by previous debility of the system.

Post-mortem appearances.—There is mostly a large collection of matter in the sinuses of the head, in the channels of the nose, and upper end of the throat, while we invariably find the mucous membrane of these parts ulcerated,—the character of this glandulous matter being to ulcerate and poison. The lungs, as a rule, contain tubercles, particularly if the disease has existed for some time; and so invariably is this seen, that some are disposed to think it is a scrofulous disease of a chronic form. We will also find that the surface of the windpipe is more or less ulcerated and covered with pus—the mucous membrane of the stomach and intestines sometimes participating in this ulceration. These ulcers that are formed secrete unhealthy pus, which extends by poisoning the system more and more, thus propagating the disease. The causes of the ulcers are two-fold. First, they may be propagated by contagion—by this we mean the introduction of any matter from the diseased surface of one animal to the healthy surface of another—that is propagating the disease. Again,

inoculation is just artificial contagion. We may take matter from a glandered horse, and give it in a ball to a healthy one, without producing the disease—the digestive organs seem not to accept it. On the other hand, if we take this matter and rub it into the mucous membrane of the nose, the animal will at once contract the disease, which will be manifested in a few days. But a great number of horses take the disease by being fed in the same stable. They seem to pick up some particle which the diseased animal had left.

Again, the majority of cases arise without contagion; for you may shut up a healthy horse in the same stable with a glandered one for months without producing it, provided the two never come in actual contact with one another, or encounter some other exciting cause.

Horses that are kept in low, damp, ill-ventilated stables, are very apt to become glandered. In Manchester there used to be stables below the bed of the river, and in these it made great havoc. It also appears after very debilitating diseases, such as diabetes, purpura haemorrhagica, pneumonia, &c.: in fact, it is a disease which depends partly upon debility, and arises from impoverished nutrition—some horses becoming glandered sooner than others.

Nature and Symptoms.—Everybody is impressed with the idea that it is a most loathsome, hateful, and fatal disease.

The most prominent and notable symptoms are a discharge from the nose, which differs from all other matter in certain respects. Accompanying this discharge we have ulceration of the mucous membrane, with induration of the submaxillary glands under the lower jaw. These we will examine and consider separately.

First, with regard to the matter. This is a notable symptom, but it is not the first sign we may have. A discharge takes place from the nostrils for weeks before any ulceration is seen or induration felt: and here let me tell you the properties of healthy pus. It is a greenish-yellowish fluid, slightly tenacious, of an oily feel, with little or no smell. The chief chemical constituents of pus are oil and albumen, floating in a serous fluid.

Now, in the first place, we have a slight elevation on the surface of the mucous membrane. This is of a faint livid hue. In a few days more it comes to a point, when we can see a dullish-yellow substance underneath the membrane. In a short time this becomes covered with blood, and eventually disappears, leaving a hole, which is the ulcer, the character of which is, that it has always a tendency to spread. It enlarges by its edges being more and more eaten away, and can be distinguished by the matter it discharges, as also by its edges being covered with a fungoid growth, having the appearance of being mouse-eaten. No ulcers have such a

tendency to spread as these have. They are of various sizes. Sometimes they run together, so as to form patches; at other times they are single, and at others are covered by a scab, particularly if they are broad. This scab is merely the pus dried up. It is generally thought glanders is a most sinking disease; but this is not so, at least in the commencement. These ulcers spread by the tissues of the nose breaking up, due to impoverishment, so that they dissolve and come away with the pus. In acute cases both nostrils are affected.

Then, again, with regard to the glands under the jaw. If the disease be confined to one side of the head, the glands on that side will be affected; but if we have the disease on both sides, then both glands will be involved, the swelling of which is peculiar.

In most cases we find these glands—namely, the submaxillary— are the first to become fixed to the jaw. This state of matters is effected in the following way: They first become inflamed, and, as a consequence, lymph is exuded, which glues the parts together, fastening them according to the extent the disease goes.

Some people think that a horse is not glandered until this gluing together is effected; but this is not the case, as there are other symptomatic evidences that cannot be disputed, and which conclusively determine the presence of the disease. In many

very acute cases we have haemorrhage from the nose, which is produced by the ulceration breaking up the blood-vessels.

Most horses affected with glanders have a kind of anxious look about them. The hair is rough, dull, and stands erect about the head, and as the disease extends, this appearance of the hair spreads over all the body. The animal will, and does in most cases, eat as well as ever ; but this does not seem to do him any good, as he gradually loses flesh and wastes away.

Now it is not safe to trust to any symptoms other than those three chief characteristics of the disease : first, the peculiar pus ; second, the formation of the ulcers ; and third, the enlargement of the glands.

Another question arises—Why do the ulcers appear in this special region of the subject ? First, this membrane is of enormous extent, being larger than that of any other domestic animal, the ox included : second, the horse breathes entirely through his nose, therefore it requires some amount of moisture to protect it from the effects of the atmosphere ; and to provide against this it is copiously studded with small holes (which I have already explained) called follicles. These secrete the mucus, while the membrane is extremely delicate. And when any debilitating disease attacks the system, such as diabetes, &c., this membrane is always affected, due also to its constant exposure to the effects of the atmosphere.

The next question that arises is—What is the cause of these ulcers, which are so common and reliable symptoms of glanders? Now there can be no doubt but that it is a disease of the blood, in support of which the following reasons are given: Farcy, which is an affection of the absorbent system, and which, if left to itself, runs on, assuming a chronic form of glanders, showing that it will not ulcerate until such time as the whole system through the blood becomes contaminated with the matter of farcy.

Then, again, if you introduce any pus or unhealthy matter into the veins, and the animal survives the operation, he will be sure to have the disease. Therefore, in the treatment of farcy, the efforts must be directed to the alteration of the blood, and its eventual purification.

Signs by which we distinguish it from other diseases.
—In the first place, there is not another disease resembling it. It stands pre-eminently aloof from all diseases that affect the horse, although we often hear people saying such and such diseases are like glanders. No doubt there are cases which we cannot at once decide upon, and say they are or are not glanders, especially where we cannot see the ulceration. But we have very good reasons for suspicion if the discharge is proceeding from one nostril, and that discharge falling to the bottom when dropped into a bucket of water; and, again, if there is no disease of the teeth, bones of the head, or larynx,

&c. With these symptoms present, and doubt still dwelling in your mind, you have it within your power to hasten, develop, and complete the proofs by bringing it to a crisis, which may be done in several ways.

Take a little matter from the suspected horse, and inoculate a donkey or worthless animal, or even the animal itself may be inoculated, if the former cannot be got. The mucous membrane of the nose, or under the throat, inside the arms or thighs, and in front of the breast, are the usual places you should insert the matter. Suppose it was the worthless animal upon which you were making your experiment, you should insert the pus into the mucous membrane of the nose—and this may be done by simply scratching it first, and then rubbing in the matter. Also, make incisions at the other parts of the body already mentioned, and introduce it there as well. You will then have the disease, if it is glanders, produced in about ten days. Should you inoculate the animal itself, it must be done in the same places and manner; when you will have the ulcers produced in the nose more speedily, while farcy-spots will be observed in the places where the matter was introduced.

Should it not be convenient to proceed as described, the next step is bleeding. Bleed copiously, give a powerful purgative, combined with work, for three or four days, and this will often develop it.

It sometimes happens that after a severe attack of influenza, bloody spots appear in the nose, which break up and discharge. These spots may be taken for glanders ulcers, but they may always be told and distinguished from them by not being ragged-looking, and having no proud flesh around their edges; so that the diagnosis of glanders is really very simple, when one remembers these enumerated facts. I may only remark, in closing the subject, that every care should be taken by attendants to avoid, as much as possible, contact with the affected animals. Treatment there is none.

The next disease we will consider, or, properly speaking, the consequences of other diseases, is

Purpura Hæmorrhagica.

This name literally means purple blood. It follows diseases such as strangles, bronchitis, diabetes, excessive purgation, &c.—or, in fact, any disease that tends to debilitate the system.

Post-mortem appearances.—The capillary blood-vessels in all the soft tissues, as under the skin, in the lungs, &c., are burst, and the blood, as a consequence, oozes into their substance. This appearance has led many to pronounce it an inflammatory disease; but such is not the case, as you will sometimes see nearly the whole of the intestines almost an inch thick with blood. This is not perfectly coagulated,

but is in a kind of semi-fluid state, showing that it is not an inflammatory affection; while the same is witnessed under the skin, the limbs, head, under part of the belly—in fact, the whole body seems to be involved in the attack. We find some parts in one horse affected, and other parts in another; but the external parts are always implicated more or less, and in very bad cases the internal organs as well. When the blood is examined, it is found to contain an unnaturally small quantity of fibrin, while this fibrin appears to have lost its coagulating powers. These are the essential conditions on which purpura depends.

Again, it may be noticed that there is also a deficiency in the red globules. Now when the blood of any animal is deficient in fibrin, it ceases to circulate properly through its appropriate vessels, as the fibrin is of great use in keeping the other elements of the blood together. Were it not for this fibrin, the red globules would separate from the serum; therefore, owing to its scarcity, the red globules break up and collect in the capillary blood-vessels, which in time give way to this pressure,—hence the appearance described.

Symptoms.—The first of these is swelling of some part of the body—the legs being generally the first, beginning below, and rapidly involving the whole limb in a few hours. It sometimes commences in one leg only, but most commonly in two; at other

times the whole four may be affected at once. When the swelling first makes its appearance, it is difficult to tell whether it is caused by simple serum or not; but you can soon determine, as it has a peculiar firmness and fulness about it different from the swelling of dropsy. The skin is hot, often pits on pressure, but is not very painful, unless combined with erysipelas.

The head is also swollen, while it is no uncommon thing to find blood trickling from the nose and eyes. If we look up the nostrils, several blotches are frequently seen, owing to the blood being extravasated from the vessels, and confined by the mucous membrane. This membrane ultimately bursts, which accounts for the blood we see coming from the nose now and then. The whole mucous membrane of the eye, as well as that of the nose, is completely brown from the above cause.

When the disease advances, the legs crack, and blood oozes through—not true circulating blood, but serum mixed with blood-globules. This condition may extend over the whole body. In other cases we have no bleeding at all, only a simple exudation of watery fluid. The swelling in this disease is very liable to extend. It begins in the most dependent parts, such as the legs, lips, and head, spreading in bad cases all over the body.

A horse suffering from this complaint, more especially if the disease be extensive, blows a good deal,

and has feverish symptoms. So long as the disease is confined to the head and legs, the pulse is pretty strong, although it is easily compressible; but when the whole body becomes affected, the pulse gets quick and weak, while the animal always exhibits great difficulty in moving, and stands as if he were on four pieces of wood, instead of his own limbs. If a horse gets gradually weaker and worse towards the fifth or sixth day, with the pulse declining, the bleeding greater, and the other symptoms aggravated, he usually dies. But if, on the other hand, towards this time the symptoms become abated, a favourable termination may be expected.

Recovery from this disease is peculiar in various ways, as the spots may completely disappear, and if the horse has been only slightly affected, he will be all right in a few weeks. But where there has been much bleeding, we often see the skin slough off to a great extent. Sometimes we encounter cases where the whole skin—from the stifle to the hock, or the knee down to the fetlock—has sloughed away. Still nature in many instances makes wonderful cures; but when the sloughing is all round the limb, it is not worth much trouble keeping the animal on—therefore we may say it terminates in recovery or sloughing.

Treatment.—The great object is to keep the patient comfortable and supplied with cool air; while as much nourishment must be got into him as you

possibly can get him to swallow, in order that the deteriorated quality of the blood may be overcome.

With regard to medicine, tonics should be given, whether he is inclined to take them or not—more especially iron, as there is no remedy equal to it where the blood is at fault. Should there be great debility, employ stimulants, with as much chlorate of potash as you can with safety give in the water to drink; also give the following ball in the morning: sulphate of iron, $\frac{1}{2}$ ounce; camphor, $1\frac{1}{2}$ drachm. In a few hours after, follow up with—carbonate of ammonia, 3 drachms; powdered gentian, $\frac{1}{2}$ ounce; powdered ginger, $\frac{1}{2}$ ounce.

Two of these should be given during the day, while fomentations should be applied to the swollen parts. These not only relieve, but tend to lessen the fever, which greatly depends upon the mechanical inconvenience; therefore there is no use whatever in giving sedatives to abate the fever.

The diuretics should be given in as much water as possible.

If the swellings are very large, we are disposed to puncture them; but this is not so useful as at first might appear, for very little comes away, and sloughing is likely to follow, as the skin is weakened; while in other cases—such as under the abdomen—puncturing does seem occasionally to be attended with benefit. Turpentine is greatly recommended as a

diuretic in this complaint; but in my own practice I eschew it.

Erysipelas

is a disease of frequent occurrence in man, and a curious one it is. The inflammation which accompanies it is of a very singular character in man as well as in the horse. It is an inflammatory disease affecting the submucous tissue or the surface of mucous cavities, and is identified by various names, such as the "rose," and "St Anthony's fire." The inflammation is peculiar for running into rapid exudation, and is strikingly indisposed to the formation of pus, but shockingly given to sloughing. It is very uncommon in the horse, but is of more frequent occurrence in the cow.

When it does occur in the horse, it may exist independently, or coexist with purpura hæmorrhagica. When independent, it seems generally to come on without any assignable cause; but in the majority of instances it follows somewhat the diseases of a debilitating nature, such as the one mentioned. Again, it seems to depend upon a difference in the circulating fluid. The fibrin in this case is increased, yet the exudation does not seem to form pus.

Symptoms.—It generally begins below and extends upwards; but it may commence in any part of the body—usually the legs or head. Wherever it originates the skin is thickened and raised up, and feels

brawny, like the skin of swine—that is, hard, rough, and rigid. It is distinguished from the swelling of purpura by always being red from the beginning, does not pit on pressure, while there is an abrupt line between the healthy and diseased parts. Even the very hair feels rough and harder, and if you touch the skin it causes intense pain.

I have seen cases where the heads of the patients were so heavy that they could not lift them up, and the same may be said of the legs. The pulse will be quick, breathing hurried, considerable fever present, and appetite suspended.

This condition of swelling may affect one or all the legs at once, or the head only. These swellings have the appearance as though you tied a cord tight round the limb, preventing circulation.

Treatment.—It is very important to have the bowels opened in this disease, which can be accomplished by the diet. With reference to medicines, I must recommend diuretics and vegetable tonics. Iron does not seem so needful in this case; but if the season admit, give green food. This acts nicely upon the bowels, and with them and the kidneys in motion, the patient will soon pull through. The local treatment consists in hot applications, and the liberal use of lard or oil to the swollen parts. Should the disease extend in spite of all you can do, incisions should be made about two or three inches long, between the healthy and the diseased parts.

Scarlatina

is a very simple disease, and often enough follows those we have been considering. It is almost always accompanied by a sore throat, and there is no doubt whatever but that it frequently exists without being detected ; though in white horses, or those with white faces, you can see it at once, as the skin presents a red colour, with a tinge of yellow—the eye and nose presenting this same appearance, something similar to jaundice. There are also spots of ecchymosis seen in the nostrils ; but we have no swelling of the body as in the former diseases, though fever is present, without doubt.

Treatment.—Get the bowels opened, and then with careful nursing, and a little nitre in the water the patient drinks, he will soon recover.

Many people are greatly alarmed at the existence of scarlet fever, and watch its inroads with horror, while the scarlatina creates no fear or anxiety. It may be a happy delusion ; but it would be interesting to many to know that the distinction is in name only—the different terms signify one and the same disease.

DISEASES OF THE NERVOUS SYSTEM.

The diseases affecting the nervous system in the horse, in number, if not in nature, are much fewer than what we observe in man.

Apoplexy

is a disease of such rare occurrence in the horse, that it is unnecessary to dwell upon it.

Tetanus, or Locked-Jaw,

is so called because it locks or fastens together the jaws. It is a disease of the nervous system, inducing a continual spasmotic contraction of all the voluntary and most of the involuntary muscles of the body. There are a few cases in which the muscles about the head and neck are only affected: when so, it is called trismus.

Tetanus is a more frequent disease in the horse than in any other domestic animal; and bulls appear to be more liable to it than cows.

Symptoms.—These are singularly alike, whether we notice the disease in man or horse. It occurs under two distinct forms—TRAUMATIC and IDIOPATHIC.

By traumatic is meant that kind which arises from causes which we can penetrate—such as pricks, injuries, &c.

Idiopathic is that kind which arises without any assignable cause. This distinction, I am afraid, cannot be maintained, for the cogent reasons herewith adduced. As it is now known that these so-called idiopathic cases frequently depend upon some affection of the internal organs, they are therefore, in point of fact, as true traumatic cases as any.

Although we cannot penetrate the irritated part with the eye during life, we have good reason for saying that the spinal cord itself is generally the part where the mischief commences; for if we irritate the spinal cord of an animal without pressure, we can cause tetanic spasms and symptoms (pressure produces palsy). Then, again, if the spinal cord of a frog be laid bare, and a drop of strychnia be applied, this will produce tetanic symptoms.

In speaking of strychnia producing tetanus, a German doctor administered *nux vomica*—which is the active principle of strychnia—to a number of patients, in all of which tetanic symptoms were observed whenever any cold draught met them.

Again, it is said to be a disease of the brain by some; but this is not the case. We are rather of opinion that it has its origin in that part of the spinal cord contained in the cranium, which is called the medulla oblongata—the spinal cord having a deal to do with regulating the motions of the body. Then, again, in tetanus the brain has none of its functions impaired—such as hearing, seeing, smelling, tasting, &c.; therefore we have no reason to conclude that the brain is diseased in this complaint. But we must come to the conclusion that it is a disease of the medulla oblongata, because we can produce tetanic symptoms by applying irritation to that organ.

It is also said to be a disease of the voluntary muscles; but I think it affects the involuntary also,

as we know how difficult it is to give an injection in this disease, owing to the constricted state of the sphincter ani ; then we also know how difficult it is to get the bowels open, and this arises from the constricted state of the muscular coat of the intestines ; while the very arterial tubes are involved in the spasms, as they are now known to contain a certain quantity of involuntary muscular fibre which is supplied by nerves.

The symptoms in the horse generally come on with a kind of gradual accession, taking three or four days before they reach the worst. Should they get very severe by the second day, the patient seldom recovers, as the cases which reach their intensity soonest are the worst to cure.

Tetanus may exist in all degrees of intensity ; so much so, that the thigh-bones in man have been broken. This extraordinary rigidity of the muscles causes the temperature to be raised as well.

One of the first symptoms is a general stiffness of the loins, tucked-up belly, hardness of the muscles, and a slight erection of the tail ; and in a day or two there is a visible stiffness of the jaws, accompanying which we have abundant secretion of saliva. The head soon becomes drawn up by the rigidity of the muscles, then the membrane or cartilage of the eye drops down over the greater part of the ball ; and when the head is suddenly elevated, this membrane will be seen protruded over the eye. As the disease

becomes more aggravated, the hocks become turned out, the limbs stiff both before and behind, and the animal moves as if he were on stilts. The abdominal muscles are tucked up, and the muscles of respiration are rigid, causing difficulty in breathing: this also depends upon spasm of the muscles of the larynx. When the disease has attained this state, a horse betrays great irritability if you approach him. The jaws are quite fixed, the membrane of the nose is reddened, while congestion of the lungs has set in; the nostrils are dilated; obstinate constipation is present; the patient cannot urinate properly. This appears to be the only organ in which secretion is not arrested; and he perspires copiously. The pulse is remarkable in the first stage. It is generally strong, but as the disease advances, it becomes oppressed. We feel a large artery, but no distinct beat.

When a horse with tetanus gets down he seldom lives long, as he cannot breathe; so the longer he stands, the longer he lives. Should an animal with this disease continue for a week or ten days, and by that time his bowels begin to act, he will as a rule pull through. But recovery is a slow process, and is always the slowest in those cases in which the disease was most acute, while some never recover properly.

Causes.—We know that many cases arise from wounds, and we also know that irritation of the spinal cord will produce this disease; therefore there is

good reason to believe that it is caused by nervous or spinal irritation in every case. The majority of cases arise after wounds ; but as to the exact time at which it does appear in our patients, it is difficult to ascertain. All we know is, that it seems to come on just when the wound is healing, or perhaps has healed ; and seems to result from a punctured wound rather than a lacerated one. It is a common notion that it follows wounds of tendons—which has arisen from the fact that punctured wounds are generally below the knee and hock, in the legs or tendinous parts. The sudden action of a draught, or cold air, is very apt to hasten it.

Again, the fatality is great ; for out of 100 horses afflicted, from 80 to 90 will die.

Some people say that worms cause tetanus, by producing derangement of the digestive system. All I can say is, that on making *post-mortem* examinations I have failed to trace it to such a cause ; for in them I have found none.

It is a common disease in hot climates, while it is said to destroy a greater number of black people than white.

Post-mortem appearances.—These are somewhat variable—yet there is a certain degree of uniformity, for we always find intense congestion of the lungs, and from this we are bound to conclude that congestion accelerates death. On examining horses that have died of congestion, we often find them not

so much congested as in cases of tetanus—therefore I think it fair and conclusive to consider that it accelerates death. Now this congestion seems to depend upon the confirmed action of the muscles of respiration. The spinal cord is also congested; while it is a curious fact that the tetanic tension of the muscles disappears soon after death,—but of course it will return in time, when we have the hard firm feel of the muscles.

Again, rupture of the muscular fibres is frequently seen, consequently there is extravasation of blood; and sometimes some of the muscles are pale—the blood having been all squeezed out. Foreign bodies have also been found in the wounds of tetanic patients; while in some of these cases the irritation has been traced along the nerve to the spinal cord.

Treatment.—This disease has been, and still is, treated in all kind of ways; and a very great deal has been said about it, as it is such a serious disease. Those cases seem to do best when we support the system—keeping the animal quiet and the bowels open; so make it your earnest effort to keep the bowels open by injections, &c.

Among the innumerable remedies, there is not one that has been so extensively used as opium; and many cases have recovered under this drug. But when we consider the enormous quantity a horse can take without producing any effect—particularly in this disease—one does not feel disposed

to believe in the efficacy of it; as it is stated for a fact that in one case a man swallowed two ounces daily, for eleven days in succession, under tetanic spasms, and in the end died. And there is another case on record, that a man—he was a negro—took one drachm every three hours for seventeen days: after this enormous quantity he recovered.

Abernethy once found thirty drachms of undissolved opium in the stomach of a tetanic patient that had died. Now, if we reflect upon the extraordinary quantity a man will take, and compare it with doses that are sometimes recommended, it compels one to question its efficacy.

When chloroform and ether were first found to possess that remarkable power of relieving spasms, it was thought they would prove of great benefit in this disease; and so they have in man, but as yet they have failed in the horse. I have administered chloroform on several occasions—in all of which it suspended the spasms for a time; but they always returned again. Many think that it would be useful to mitigate the spasms, in order to give other medicine; but although this allows us to open the jaws, yet they forget that it does not make the animal swallow, and therefore many have been choked in this manner. Extract of belladonna is much used, and we must admit that many cases recover under it; therefore we are at times tempted to believe that it does possess a certain amount of utility. But

we should examine both sides of the question—as in all cases I have seen of recovery from its use, I have found that the bowels were well opened before or during its action.

Again, extreme cold has been employed as a cure—for cold seems to relax the spasms—and horses have been plunged into cold water, or had it pumped over them. Sudden fright has also had the effect, by relaxing the muscles; while eminent men in the profession recommend locking the stable-door and taking the key in your pocket. But apart from all that, the best cure is to get the bowels open if possible, and afterwards give the belladonna; then allow the patient plenty of cool air. Keep him in a dark stable or box; shut out all light, and leave him in absolute quietness.

The next question is, What are we to do to keep up the system and keep the bowels open? The horse will not eat, so cannot take nourishment himself, as the mouth is closed; and even if open he could not swallow. In such a case gently elevate the head, then put a flexible tube down the nostrils, having a bladder fixed to the end of it containing either the medicines or gruel that you are about to administer; then gently squeeze the bladder, allowing only a few drops to trickle down at first, which can be gradually increased as the patient gets used to it. Give also gruel-injections, which are taken up into the system by absorption. Some people

apply mercurial blisters along the spine, while others insert setons; but I think this is only adding irritation to irritation—therefore a good, fresh, newly skinned sheepskin is the best and simplest thing to excite a copious action in the skin without producing irritation.

Megrims.

This is sometimes, but improperly, called staggers, as it is only a symptom of the disease. The term megrims is of very common use in some parts of England, and seems to consist in a temporary loss of voluntary power and motion.

Symptoms.—The horse will often shake his head, showing the fit is coming on, then look at his flanks, and fall down. There is no spasm while he is on the ground, and hardly any pulse to be felt; but in a few minutes he will get up and give himself a shake, as if nothing had happened.

It is frequently seen in farm-horses, particularly the heavy kind, and comes on while they are at work in the collar—especially when they are rather distressed in going up a hill. It may or it may not be accompanied by a disease of the brain. It is a curious fact that the horses that have this disease are seldom, if ever, affected, unless they are in the collar. This tends to convince me that it generally arises from temporary congestion of the brain,

caused by obstruction of the jugular veins by the collar.

Treatment.—Allow the animal a roomy collar, and food that will not constipate the bowels, and give an occasional dose of medicine.

Chorea, or St Vitus's Dance.

This disease is seen more frequently in the dog than in any other animal: it also occurs in children, and is seen in the horse occasionally. The remarkable features of it consist in a combined or regular movement affecting certain groups of muscles, whose action is quite involuntary, and seems to be increased when the will is excited. It is, apparently, a disease of the spinal cord, affecting only the nerves of motion, and not those of sensation. This is proved by a man with chorea not having the spasms removed by sleep; for it is demonstrated that the brain sleeps when you sleep, as is shown by tickling any one's foot when asleep—he will draw up the leg, but it is quite unconsciously. The symptoms are similar in all animals. Men stagger as though they were drunk, and look idiotic, though they are not; there is a continual twitching in the part that is affected, and it is constantly in motion, up and down or from side to side. Others, again, may appear all right when standing still; but immediately they attempt to lift the leg, they cannot do it.

There is another form of chorea in the horse, which

comes on by starts, and which it is well to guard against. If you go to put a halter on some horses' heads, or look at their teeth, they will throw up their heads, fix their lips, and run backwards—the muscles of the neck becoming quite rigid.

It may affect the head and neck only, or one leg; or the whole body may be affected, or only one half; or sometimes the tail alone is implicated.

Again, a man with chorea, generally speaking, can run better than walk—just in the same way that a stammerer can sing better than talk.

In dogs it frequently follows distemper; but in the horse we know not what it arises from.

There is no treatment.

String-halt

consists in an involuntary twitching of one or both hind-legs; sometimes it affects a fore-leg, but this is very rare. There is a striking similarity between this disease and the last mentioned, but I do not mean to assert that they are the same. However, some cases of chorea may terminate in string-halt.

Causes.—Many versions are current relative to the production of this disease. Some say it is due to a tumour on the brain, some to rupture of the muscles inside the thigh—some to one thing, and some to another; but I think we have yet to discover the true cause of string-halt.

There is no treatment for it.

Phrenitis, or Mad Staggers.

This is inflammation of the brain and its covering membranes.

Post-mortem appearances. — The whole extent of the medullary and cortical substance is reddened, though at other times it is not perceptibly red, but softened. The brain is one of those organs that may be inflamed without being reddened; but we have in these cases softening, accompanied by a formation of pus and serum, while certain parts are softer than others. This is the case with the cerebellum, where we are sure to find the softest spots.

On opening the head of any animal, we always find a quantity of fluid, which, if it be healthy, is perfectly clear and straw-coloured; but if it is muddy, and contains lymph, we may be sure there is disease. This is not a very common disease in the horse, and when it does occur, it seems to come on without any assignable cause, although it is said to be very common among horses in salt-marshes.

Symptoms. — At the commencement the patient seems dull and stupid, the pulse slow and strong, and there is usually constipation, with a limited quantity of urine voided. By degrees he gets excitable, the eyes and nose become red, the pulse gets hurried, and fever sets in, when he generally gets down, or stands in a corner hanging his head. If excited, he will kick and strike in the most dangerous manner possible;

but in most cases he will be down. The jaws become clenched, and cannot be opened to give medicine; there is no paralysis of the limbs, as they can be moved freely; and sometimes he rears upon his hind-legs, climbing the walls, and destroying everything around him.

Treatment.—Give a large dose of purgative medicine, shut him up in a dark place, apply cold water cloths to the head, and give injections every hour until the medicine acts. Get all out of him you possibly can in the shape of food; while he should have nothing to eat until the symptoms have entirely subsided and passed away. Blisters should never be applied—they excite, do not allay, irritation.

This disease seems to have a tendency to the formation of tumours on the brain, more particularly after chronic attacks. Palsy does, and string-halt is said to supervene.

STRUCTURE OF THE TEETH,

WITH SOME REMARKS ON THE SAME.

The teeth are of much importance, not only to the animals themselves, but to us as indications of their age, either in the horse or cow. It is generally said that the age of a horse cannot be told after eight years old. This to a certain extent is true; but if we pay attention to the structure of the teeth, &c., we

may determine the age pretty accurately for a few years after this.

Thorough-bred horses' ages date from January, and not May, as is the case with coarse-bred animals; therefore in telling the age of a blood-horse the same appearance is looked for in the teeth in January, as what is seen in that of the lower breeds in May. The difference of date depends upon the one in a general way being born in the beginning of the year, the other not until a later period.

In examining a horse with reference to age, you require to pay great attention to the marks, to see whether they are natural or artificial, more especially in a town. The artificial dodge is called *bishoped*, or *bishoping* them.

A full-grown horse has forty teeth; the mare has thirty-six, or four less. These are permanent, and are arranged in the following manner: six above and six below in front, called incisors. Anterior to the first molars of each row, and posterior to the incisors, we have two above and two below—canines or tusks; and there are the six molars on each side, above and below, thus:—

Incisors.	Canines.	Molars.
6 upper,	1—1 upper,	6—6 upper.
6 lower,	1—1 lower,	6—6 lower.

The mare has no canines, which accounts for the four less than the horse. All these, then, are made

up of the same materials, but those materials are differently placed.

When a colt gets all his temporary teeth, he has the same number of incisors as the permanent; but he has no canines, while he has only three molars or back teeth on each side—above and below. These become changed and supplied by others, so the appearance of a full colt's mouth is this:—

Incisors.	Canines.	Molars.
6 upper,	0—0,	3—3 upper.
6 lower,	0—0,	3—3 lower.

Total in the colt, twenty-four. Besides these there are others called wolf teeth, not numerated with them.

Every tooth consists of three parts—the root or fang, which is contained within the gums, and goes into the bone; next the neck or cervix, which is fixed round with the gums (this is not so well observed in the horse, but is seen to advantage in the cow); then the part which stands above the gums, called the body or crown.

If we take a young tooth and examine the root we will find a hole: this is the pulp-cavity, which contains the pulp, and in old animals this cavity becomes filled up with bone. The pulp is a vascular, nervous, cellular substance, which receives the supply of vessels and nerves through the small opening at the apex of each root. This pulp is included

within a thin delicate membrane, and every tooth grows from it, which in a natural state is never exposed, but is so when caries or disease sets in. It is owing to this exposure that we suffer pain in toothache ; but this is not a common complaint in our class of patients.

A tooth consists of three anatomical elements, namely—first, bone dentine, or ivory; second, enamel, which is the hardest substance in the whole body ; third, *crusta petrosa*, or cement. First, the dentine or ivory is always contained in the inside, and grows from the pulp. It is always growing, in fact ; that is to say, as long as there is a pulp. Outside of this we have a layer of enamel, which is recognised by its external whiteness, hardness, thinness, and its shining appearance, while outside of this again is generally a shell or *crusta petrosa*. Again, in the dentine we have not true haversian canals, but we have tubes from the pulp-cavity, which, when they reach the dentine, break down and anastomose. These tubes in the young animal are filled with a succulent matter, divided from the pulp. In old horses the *crusta petrosa* assumes the character of true bone, imparting that yellow appearance. It is least abundant in the canine teeth, particularly in the dog.

Enamel, as we have said, is the hardest substance of the body. It does not contain either haversian canals, *lacunæ*, or *canaliculi*, but seems to be made

up of a series of fibres, which, when examined, are found to consist of hexagonal crystals—in fact it is a complete block of inorganic substance, containing no vessels of any kind. Now, when we look at these three materials, we must come to the conclusion that the *crusta petrosa* is the softest, and consequently must wear away the soonest. This is well seen in the molars: they are almost always the most irregularly worn of any. You can even see the enamel and dentine projecting beyond the level surface.

Again, the incisors of a horse are much more complete than those of the cow. A cow's tooth comes to a sharp point in the centre, similar to a chisel; but in the horse we have two sharp points and a cavity on the crown. The pulp is always, when in a soft state, the exact model of the future tooth, and in the horse you can see the hole or mark of the future tooth. From this we have a thin layer of dentine formed around, which is the enamel; this takes on the same shape as the dentine, and lines the hole or infundibulum, and it is always the largest when first cut, as it has not been worn. This cavity is lined with *crusta petrosa*, surrounded on the top with a layer of enamel; but the two cavities do not meet, as the pulp-cavity is a closed one. The upper incisors are larger in every way than those of the lower jaw; they are also longer and broader, and have a larger infundibulum.

On looking at a horse's tooth in front, it gets gradually narrower as we proceed downwards. In permanent teeth their anterior surface is nearly flat, and the posterior or mouth surface convex: this prevents the teeth injuring the tongue; while the sides are flattened, so as to fit the other teeth. They lessen in breadth from the face to the fang, so that the broad surface disappears with wear. Thus it is that teeth become narrower as age advances, and as they wear away we find that they not only become narrower, but straighter than the body part. A young tooth again, say five years old, is broader from side to side than from before to behind, but the opposite in old age. Whenever, therefore, you see a mouth with the teeth wider from before to behind than from side to side, with the appearance of a six-year-old, you may rest assured that he has been *bishoped*, particularly if the teeth appear straight; for in proportion as age advances, the teeth become more and more triangular, or broader from before to behind than from side to side, as already mentioned.

The infundibulum or date of a tooth may be said to extend to the bottom of the body of the tooth, and perhaps a little further. In a perfect tooth the infundibulum of the inferior incisor is about an inch in depth, and that of the superior about an inch and a quarter. As we have already noticed that the *crusta petrosa* is the softest material, it very readily absorbs moisture and becomes stained with the juice

of the food: this staining becomes deeper in hue, more especially if the animal be at grass.

The infundibulum, or date-mark so called, may wear away, as it generally does, by eight years old, when the horse is then said to be aged; but there is always a vestige of the date left. For some time afterwards we have the ring of enamel and some of the *crusta petrosa* remaining, so that it is at this period—say from nine to ten—that horse-dealers take advantage of *bishoping* horses, and making them appear as five, or six, or seven years old, as the case may be. The implement used for this purpose is an engraver's tool, or other hard instrument. They dig out the *crusta petrosa*, then stain the hollow with strong acid.

Difference between Temporary and Permanent Teeth.—A temporary tooth is distinguished from a permanent one by several characteristics—namely, it is invariably convex on its anterior surface, from above downwards, and from side to side; there are no grooves in it, as in the permanent; it is always whiter in colour, owing to the absence of *crusta petrosa*; and it has a bright polish. There is also a great disproportion in size between the body and the fang; the latter shrinks very rapidly after it leaves the body, so as to form a distinct neck. Then, again, the red gums appear to encircle a greater part of the body of the tooth than in that of the permanent, owing in a great measure to the gums extend-

ing up between the bodies of the teeth, caused by the spaces formed by the neck of one tooth not being parallel as in the old teeth ; and the posterior surface of a permanent tooth is round, while that of a temporary is flattened on either side.

Changes that take place after birth as indications of age.—At or a few days after birth a foal has two incisors, above and below—this depends upon the time the mare goes in gestation ; by the end of four or six weeks, other four incisors make their appearance, so that in all we now have four above and four below. The last four do not make their appearance until the foal is about ten months old, when we shall find them cutting the gums, and by a year old they are well out, but not in wear—while the others are well worn. Between this and eighteen months, we find the corner ones have come into wear ; and by the time he is two years old, the infundibulum or marks are gone, except the corner ones. At two and a half we find the central teeth getting narrow at the necks, but they keep their breadth at the face. This is owing to the fangs of the teeth becoming absorbed, in order that the permanent teeth may grow up in their place ; still the body remains as a protection to the new tooth until it is up. At this time we see a prominence or bulging of the gums, owing to the gradual growth of the permanent teeth ; and when he is two and three-quarters, they generally peep through the gums ; so that at three years old

they are well up, and soon get into wear. It sometimes happens, however, that these central teeth are not in wear at the time from which they take their age—that is, the 1st of May. This is owing to the animal not having been foaled till late in June. But still he is called a three-year-old. It will be next noticed that in a three-year-old mouth we have the four permanent teeth—two above and two below; these are up and in wear, particularly the anterior edges. Between three and three and a half, the fangs of the middle teeth undergo absorption, as in the former case, with the same bulging present; so that a little before the animal is four years old they generally make their appearance, and by the time he has reached four they are well up and in wear. Between four and five the same changes occur in the corner teeth, and by the time he is five years old they are up and in wear. Sometimes the posterior edges of the corner teeth are so brittle that they break, when they have the appearance of a cow's tooth. Again, the middle ones are often broken; and when this is the case, the central ones are generally filled up with *crusta petrosa*. If the teeth present these appearances they are called shell teeth. It is possible to give a four-year-old the appearance of a five-year-old by this sort of mouth, and particularly so when the foals are dropped early—say February or March. However, such information is better withheld, as it can serve no good purpose.

The canines or tusks are also usually up at five, though not much to be relied upon, and are the smallest teeth in the animal. Passing now from five, by the time he is five and a half the black marks in the central teeth are nearly gone, but a remnant of the infundibulum is still to be seen. By the time he is six they are completely obliterated, while the corner teeth are flattened all round; but the upper ones are rather notched, caused by the wear and tear they undergo from the rubbing of the lower jaw upon them, and the summits of the tusks are a little worn. At seven years we have a similar appearance, but seen to a greater extent. The marks are now gone from the middle as well as the central teeth, while the notching in the upper corner teeth is much deeper, and the tusks more worn. At eight years the marks have disappeared from all the teeth on the lower jaw, the notch is deeper, and the tusks have become flattened. This is the aspect of the lower jaw, while in the upper jaw the marks remain, although they are smaller in the central teeth. At this period a horse is said to be aged, when he has lost the marks in the lower jaw.

After eight years old it is not easy to describe the appearances so as to tell the age. This is best learned by close attention and practice; but after that age the teeth become rapidly straight. In the upper jaw the marks are generally seen in the centre incisors until ten years old; at twelve the next become

effaced ; and at fourteen the marks are all obliterated above. Therefore a mouth with no marks whatever, and pretty straight teeth, will indicate the age at about sixteen or seventeen. The molars are of little importance with reference to age. Sometimes they become too long at the edges, and prevent the animal from masticating his food properly. In such a case all that is required is a rub down with the teeth-rasp.

When a colt has got a full set of permanent teeth, he drops that appellation, and assumes that of a horse ; and the filly is also transformed into a mare.

There is a disease which is liable to attack young horses and colts—namely, inflammation of the sinuses and pulp of the teeth. The animal will go off his feed ; there will be swelling on the side of the jaws, with a discharge from the nostrils. This has been mistaken for a collection of matter in the sinuses, and operated upon accordingly ; but it is a great error, as we have no proper sinus until the teeth are all up. Fomentations are of little use here : it is better to apply repeated blisters.

TUMOURS.

This department is well represented in the human practice, and unfortunately they appear in all shapes, sizes, and situations ; but in our practice we find them much less numerous, and in a general way not of a very malignant character.

A tumour may be defined to be a perceptible or definite addition to the substance of any part of the body. They occur under two great characters: First, there is a class of tumours made up of textures similar to those already existing in the body, such as bone, cartilage, &c. These are called non-malignant tumours, and are by far the most numerous kind met with in our practice. Second, there are tumours composed of tissue not existing naturally in the body, and which has a tendency to destroy and poison the body; hence they are called malignant or destructive tumours. This class, however, is very scarce; and besides, we cannot always draw a definite line between the two, although there is no doubt some tumours begin non-malignant, then assume a malignant type.

Non-malignant.—These are composed, as I have said, of materials already existing in the body, such as cartilage and bone, becoming enlarged, without any structural difference. The character of a non-malignant tumour is, that it does not destroy, poison, or spread to surrounding tissues, having no tendency to reproduction; and when thoroughly removed, the animal recovers. Tumours of this description seldom run on to suppuration or ulceration, yet they may destroy life; but this is not due to poisoning of the system, but from their mechanical inconvenience.

Malignant tumours, on the other hand, such as can-

cer, always do destroy, change, and alter the textures surrounding them into their own textures, while they poison the whole system, and are apt to grow faster than non-malignant ones. They are often connected with constitutional disorder, frequently running on to softening and ulceration. They cause pain and intense irritation in the neighbourhood; and when removed, there is no guarantee that they will not be reproduced in the same or another site. In one sense they are not themselves a local disease, but rather indications of a disease which has a constitutional seat or origin.

It is a remarkable and admitted fact that people with tumours will live longer without having them removed than those that have them cut away. At the same time, the formation of tumours is very much influenced by the constitution of the animal; and this is the case in cattle as well as in the horse. In bitches, again, it often assumes a hereditary character, and what causes it in one will not do so in another. Thus a person may receive an injury on the breast, and get well again without much trouble; whereas another may receive a similar injury, and, particularly if there is any constitutional diathesis, a tumour may be the result.

Horses are not so liable to tumours as cows, and cows are not so liable as bitches; for in the latter animal we have them almost as frequently as in mares.

The chemical constitution of tumours varies. The proximate principles which are chiefly formed in them are fat, gelatine, and albumen; and according as any of these predominate in the structure, the nature of the tumour is found to alter. It is rather an odd thing that the malignant contain a great amount of albumen with fat, while non-malignant consist principally of gelatine.

The great majority of tumours are enclosed in a cavity called a sac, especially those of a non-malignant nature; but tumours in the brain are not usually invested with a wall. On the other hand, a malignant tumour is seldom enclosed in a cyst, so that it is difficult to say where the healthy texture begins and the unhealthy ends; whereas, in the non-malignant, we have a pretty definite line of demarcation.

Malignant tumours in cattle are situated most commonly at the root of the tongue and the eyes, affecting the orbits; also the glands of the neck and the external organs of generation. From this you will see that they are pretty much inclined to the same situations as in women. They are classified under the general term of cancers, of which there are various, known first by the name of *medullary*—so called because they resemble the medullary substance of the brain; second, *scirrhous*, or hard cancer, which is always painful; third, *colloid*, or glue-like cancer—but this kind is never seen in

the lower animals; fourth, *fungus haematodes*, or bleeding cancer.

The scirrrous occurs most commonly in the udder of the cow and bitch, and the lips of the external organs of generation. In the bitch, it seems to come on without any apparent cause, and is slow in growth; but gradually gets to an enormous size, causing great pain and inconvenience. One feature, to distinguish it from any other tumour, is, that it seems to involve the skin. It is also red, and appears to be attached to the surrounding tissues, and soon ulcerates. If the skin is loose, and can be easily moved from the tumour, and does not appear to affect the tissues surrounding, but is hard and knotty, we may be satisfied that it is not a cancerous tumour. When we examine the tumour, there is generally found one opening, and sometimes more, leading into it. These orifices have a ring of proud flesh round their margin, and if you cut into them with a knife, they are always hard and resisting like cartilage. When examined under the microscope, the tumour is found to be composed of fibrous tissue; its base is enclosed, in which are cells, thus showing that it belongs to the malignant class. These cells are large, containing other cells or nuclei, having the power of reproduction; and, in addition, there is a kind of granular juicy matter by which the cells are nourished: therefore, owing to the presence of these cells, we must look upon the tumour as of a malignant character.

Medullary tumours are found in the head, and glands of the neck and liver, and contain the same cells as the scirrhous, but in greater proportion, with less fibrous tissue. They are known by their vascularity, by their adhering to the parts in which they exist, and from certain orifices leading to them, which are also surrounded by a ring of proud flesh.

Fungus hæmatodes are those that contain a great amount of blood-vessels and cells, with scarcely any fibrous tissue. This sort of tumour grows more rapidly than any of the others. They bleed profusely on the slightest touch, and if you cut them away they grow again, and are very unsatisfactory to deal with.

Non-Malignant Tumours

are more common to the lower animals than the malignant. Sometimes they are of enormous size and weight, and generally occur about the anus or generative organs. In the horse they are not of a malignant type, but are regarded so in man, as they generally occur in combination with cancer. Warts will sometimes grow to a great size, and will frequently appear again after being cut away. This is not owing to them being malignant, but to the difficulty of removing the entire roots.

A polypus is a kind of pendulous growth, generally attached to some superficial mucous membrane, and is found most frequently in the nose, larynx, vagina,

and sometimes at the entrance to the uterus. It usually consists of a thickening of the mucous membrane. When it occurs in the nose, it assumes a variety of shapes; but the general shape is usually that of a pear, with a bulb and neck.

Symptoms.—If in the nose, there is difficulty in breathing, accompanied with a kind of snore, particularly in inspiration; and if situated far back, there is a tendency to suffocation. We can generally see them, and they must be cut or twisted away.

Warts comprise several kinds, but are of two chief characters in the lower animals. They are either on the surface, or just underneath the skin. The former are called the common or epidermic wart; the latter the fibrous cystic, or subcutaneous wart.

Epidermic or common warts are well known to all, especially in the human subject. As they appear upon the skin of horses and cattle, there is no essential structural difference between the one and the other, though in cattle we find them much rougher on the surface than in the human being. In warts, both layers of the skin are involved,—namely, the epidermis or cuticle, which consists of scales similar to the scales of a fish, though not so large—is not vascular, and contains no blood-vessels or nerves; and underneath, the true skin (*cutis vera*), which consists of blood-vessels, fibrous tissue, and nerves.

In the horse these warts are frequently seen about

the nostrils, eyelids, face, sheath, and between the fore and the hind legs; and in cattle they occur chiefly under the abdomen, on the teats, and sides of the face; indeed all parts of the skin may be subject to them—while some breeds of horses and cattle are more liable to them than others. They are of two varieties—one of them rising perpendicularly or abruptly, the other merely spreading along the surface in patches. This does not depend upon any difference in their structure, but in their development—the single ones having generally a defined neck, especially when of a large size.

Warts always first occur in a small pimple, and when large they are very vascular. They are more common in young animals of all kinds than in old ones, therefore I think that they are owing to some irregular growth of the skin. If we take a slice of the rough surface and examine it under the microscope, after having placed it in acetic acid, we find it made up of little cells, inside of which smaller ones are found; and in proportion to the size of the wart, so are the vessels involved.

Treatment.—All kinds of charms were had recourse to at one time to banish warts; but, of course, no one entertains those superstitious ideas now. Sometimes they will disappear of themselves; but the treatment must vary according to the kind of warts you encounter. If you find a wart with a broad fleshy base, hard, and not large, you had better cut

it away at once. Apply the actual cautery, or some strong caustic, so as to destroy the growing surface. Of the two, I prefer the hot iron. Should it have a neck, you can tie a string round sufficiently tight to arrest the supply of blood, when it will die and slough off; and in this case it is always better to apply the cautery after it has dropped off, in order to destroy any remaining root.

When warts occur over the surface of the skin, you should cut away all the horny parts, then cleanse the parts from blood, and apply caustics or the hot iron. In some cases you have to repeat the cutting, so as to allow the caustic to penetrate deep enough. Cattle are very liable to have them on their tails. In these cases cut the warts away, and apply the hot iron.

There is another kind somewhat common in horses, called fibrous or subcutaneous cystic warts. These may vary in size, from a marble to 20 lb. weight. They do not involve the skin, for you can move it over their surface in any way you choose, which shows that they are not connected with the muscles. There is no pain on pressure, unless the skin is ulcerated, which is the case sometimes, and there is no sensible increase of heat. They are hard and move readily; and the tissues below the skin do not become ulcerated, owing to the non-malignity of the wart, but simply to the mechanical inconvenience it causes; for if we dissect the skin away, we come to

a great amount of fibrous tissue, into which numerous blood-vessels ramify, and from which the sac or wall receives its nutrition and growth. Inside this sac is the proper wart, consisting of a dense mass of inorganic matter; for it is very rare that there are any blood-vessels in it.

When these warts are small it is very easy removing them, by making a single incision through the skin and squeezing them out. A good-sized wart may be removed in this way. When you have a large one, and the skin ulcerated, it is more difficult to take away; therefore you must make two incisions similar to straight lines, and get to the bottom of the sac or wall. It is from this wall the wart forms, so it must be removed.

Occasionally, though not so often as in man, we find fibrous tumours affecting the internal organs—such as the kidneys, uterus, &c.—but most commonly on the inside of the cheeks, particularly of dogs: in this case they can be removed.

There is another kind of tumour occurring behind the elbow in horses, of a fibrous nature, formed from the lymph: these are caused by the animal bruising that part in lying down on the calkings of his shoes. If the cause is not prevented, inflammation of a slow form takes place, and lymph is formed, with the result that a tumour is produced. In such a case blisters do no good: they ought to be dissected out.

Fatty Tumours

are very rare in the horse or any of the lower animals; but there is a kind of tumour that forms on the back of horses under the saddle, also in the shoulder under the collar, very much resembling fatty tumours, which is composed of fibrous tissue and fat, &c.

Calcareous Tumours

(so named, because they consist of inorganic matter) are generally called bony tumours, though they are not true bone, as they contain neither haversian canals, lacunæ, or canaliculi, but consist chiefly of the phosphates and carbonates of lime. These tumours may be found attached to the parts in which they are formed, as in tendons; or unattached, as in the skin. When they are in the latter, the hair falls off in patches, while the whole coat has general unthriftiness about it.

Treatment.—The best remedy is to cut them out. Sometimes they are found in the udders of bitches, when they arrest the flow of milk. The brain, also, is said to become ossified; yet this is not the case, but simple carbonates and phosphates laid down between the interstices of that organ. The heart, surface of the lungs, testicles, &c., are also subject to the same disease.

Encysted Tumours

are those in which the contents are fluid instead of solid. This fluid is contained in a bag, which is likewise enclosed in an outer cyst or sac. These tumours are not frequently found in the horse; but when they do occur, it is generally at the back part of the tongue. There seems to be no doubt about the origin of many of them—namely, that they are nothing more than a dilated follicle of a gland, arising from some obstruction. When they occur on the tongue, the obstruction may be a foreign body getting into the follicle, such as a hay-seed, thus causing irritation to set in on the edges of the follicle. Lymph is exuded, and in time the orifice is plugged up; consequently dilatation of the follicle takes place, owing to an accumulation of its contents, which is found to consist of a cheesy fluid. They are known from a fibrous tumour by their elasticity, and they can be easily removed. There is nothing malignant about them; and when they cause death, it is from mechanical inconvenience—as in the larynx they produce suffocation, and in the nose difficulty of breathing. In some parts of England this disease is very common.

Symptoms.—The animal will work for a time apparently all right, when some day he will suddenly evince signs of suffocation, will gasp for breath, and perhaps cough once or twice, after which he will give

himself a shake, and seem all right again—proceeding with his work the same as usual for the remainder of the day without having another turn. These symptoms may return the following day, when they become aggravated. There is great difficulty in breathing; the animal appears stupid, staggers, and falls. These fits usually come on after he has been at work for some time: and it is seldom that horses manifest any sign to lead you to suspect the presence of tumours by either coughing or galloping, so the best plan is to put a collar on, and let them go to sharp work for an hour or so. When they occur on the tongue, and you can reach them, clip them off; and if upon any external surface, dissect them out.

Sometimes they are found inside the sheath, and on the inside of the shoulder of young horses; here, of course, they are easily got at.

Cartilaginous or Enchondromatis Tumours,
are very common in man; but in the horse we find them of rare occurrence. They do not often ulcerate, and when they are situated on parts where you can get at them, remove them: and once properly removed, they seldom grow again.

Melanotic Tumours

occur frequently in the horse, but seldom, if ever, in the cow. They differ in every way from other

tumours—being composed of a black colouring matter similar to charcoal, that is infiltrated into the tissues of the part on which they form. They are most common in bright grey and white horses, but are rare in dark-coloured animals, and are found particularly in those places where the skin is tinged with black—such as the nose, eyelids, lips, sheaths, anus, lips of the vagina, and inside the legs—these parts not being covered with hair. Then, again, we must consider why they occur in white horses, and why in the dark part of the skin. This is a question not easily answered, although I think we can partially account for it. For instance, in a black horse the whole skin is equally covered by the black colouring matter called pigment, and the same in a bay or chestnut; consequently it depends upon the presence of this pigment. In a white horse the skin and hair are devoid of this pigment, yet he contains in his blood the materials for its formation; therefore it is reasonable to suppose that the body, being white, possesses no allurement for this matter, except upon the dark places mentioned, where it is deposited in undue quantities.

When we examine its structure, we find the pigment consists of minute crystals. These are not enclosed in sacs, but graduate insensibly into the healthy parts, so that you cannot tell where the one begins or where the other ends; while they depend upon the infiltration of the pigment into the tissue

to add to their bulk. This pigment also consists of iron and sulphur in a great proportion.

These tumours are not malignant in the lower animals, but are considered so in man, as in him they are frequently combined with cancer. There is a law in surgery that one should save as much skin as possible in operating, so as to cover up the wound with it, provided it is not diseased; but in this case we are compelled to cut a great deal of skin away, in consequence of it being diseased. In cases where the tumour has grown within the anus, it cannot be dissected out very well; but we need not fear making a cut into it. A good deal of bleeding may be caused; but when the vessels are properly secured, the surface will soon heal, which proves that it is not malignant. Still they should not be interfered with, unless you can remove them entirely, as they will in most cases grow again.

Scrofulous Tumours.

This disease is sometimes seen in the horse, though not often; it is more common in cattle, and more so in the dog, but most of all in swine. In London about 1000 people die weekly, and out of this number 120 fall under this scrofulous diathesis.

Symptoms.—In the human subject there is a fair skin, large eyes, large lymphatic glands, especially about the neck, and large veins. In cattle the glands about the neck are the most liable to be attacked,

when we often have very large swellings ; and young cattle are more subject to these collections of matter than old ones, particularly those that come from inland counties, and are located near the sea-coast. Clyers is the name given to these swellings in England ; and farms that are exposed to east winds, near the sea, and lying in low damp places, are most likely to be affected.

The characteristics of these tumours are : they are hard, deeply seated, involving the glands of the neck and angle of the jaws, and do not move under the skin as some tumours, which shows that they are in the tissues ; so you cannot tell where they end. Sometimes they ulcerate ; and when this takes place there is no longer any doubt about the nature of them.

Treatment.—Some cut them out, but this is not to be recommended, as it cannot be done without great loss of blood, owing to so many vessels being in the part. The best thing to do is to shelter the animals well from wet and cold, and make them otherwise comfortable, and by good feeding get them ready for the butcher as quickly as possible.

DISEASES OF THE SKIN.

The skin is that material which covers the body, and is also an organ of absorption and secretion. It contains hair-follicles, and two distinct sets of glands, —namely, the sudoriferous or true sweat-glands, which are composed of coiled tubes ; and the sebaceous,

which secrete an oily fluid. These are found under the true skin, and the ducts of these glands are found opening into the hair-follicles.

The skin is subject to congestion, dropsy, inflammation, new formations (such as warts, &c.), and parasitic diseases.

Congestion is sympathetic of low diseases, and may arise from mechanical obstruction. When it is very intense, it gives rise to haemorrhage into the subcutaneous tissue.

Dropsy is a result of congestion, and is well defined in swelled legs.

Inflammation may be either superficial or deep-seated. Good examples of this are furnished in frosty weather by cracked heels, and mud fever in wet, dirty weather. The animals move stiffly, with their legs apart, and the skin is very painful to the touch.

Treatment.—Application of warm water, and then apply ol. oliva, 2 parts; liq. plumbi dia., 1 part,—twice a-day to the irritated parts.

Avoid all exercise, allow them to rest quietly, and the generality of cases will soon be all right under this treatment. Others, however, may be very obstinate, the whole skin irritable, the horse off his feed, and wasting away. In such cases select the most tempting food possible, encourage him by small quantities oft repeated, give tonics, and arrest the inflammatory process by soothing remedies.

Ringworm.

This is a less frequent disease in the horse than it is in either the cow or the dog. It generally makes its appearance about the eyelids; the hair commences to fall off; by degrees it extends all round, and continues to spread, while a kind of watery scales appear. It occurs mostly in young animals, especially calves, in which it has been so bad as to destroy numbers at a time.

Treatment.—Acetic acid. A few applications of this will cure it: or iodine 1 drachm, lard 1 ounce, mixed and applied; and in bad cases the iodide of silver may be adopted.

Wounds

are of five kinds,—1st, incised; 2d, punctured; 3d, contused; 4th, lacerated; 5th, gunshot.

First, *incised* is that made with a clean-cutting instrument, and is a clean smooth cut through the skin and connective tissue.

Treatment.—Arrest the bleeding, if any, and remove any irritants.

Professor Syme taught that the parts should be left open, and not brought together until six hours after, or till the serous discharge ceases to flow, when the wound will be found glazed over. This is due to a coating of fibrin, and if united now the edges readily adhere. Afterwards keep the animal quiet,

and dress with the following: liq. plumbi dia., 2 drachms; zinc sulp., 2 drachms; water, 8 ounces. Mix this, and apply night and morning.

Second, a *punctured* wound is the most dangerous of all, as from its depth it is apt to implicate arteries, veins, nerves, and deep-seated vital parts. The parts traversed are often stretched and torn, and are liable to inflammation and suppuration; pus forms, and having no free exit, burrows under the surrounding tissue. Then, again, foreign bodies are liable to be carried to a great depth, and never suspected until inflammation has set in; and wounds of this class are very apt to produce tetanus or locked-jaw.

Treatment.—Dilate and enlarge them (this holds good in every case in the horse), so as to allow free exit to matter or pus. In a case of pricked foot, this must be done at once. The foot must be well pared out; remove all the horn around the wound; then apply warm poultices. The pus formed in a punctured wound carries off the dead tissue found in the part. If the pain is great and fever present, give a dose of physic to open the bowels, with opium and aconite to allay the pain and fever, and keep the animal upon bran-mashes. Wounds of this description heal from the bottom towards the surface; but if you suspect any hollow, open up the wound again, and allow it to heal properly. It is a bad plan to probe a wound if it is near a joint, as it sets up suppuration.

The third class may be placed under two heads, *contused* and *ecchymosed*. This kind is produced by a blunt instrument, causing injury, with no laceration of the skin, when it is termed ecchymosis,—a familiar example of which is a man with a black eye. In this case there is, first, a benumbing of the parts, and then structural inflammation arises, the degree of which greatly depends upon the force of the blow.

Lacerated.—This is attended with more haemorrhage than an incised wound; but the surfaces being irregular and rugged, the blood effused adheres, and so, if the arteries are torn, they consequently heal quicker than when cut.

Treatment.—Bleeding to be restrained, and all irritants removed, while the parts must be brought together and quietness enjoined. In laceration of the lips, the depending parts should not be cut off, but well cleaned and brought together, when the wound may heal nicely, leaving a less scar than would otherwise happen if you employ the knife. When the fever is subdued, give good food, in order that the blood may be supplied with requisite material for the repair of these parts.

Open Joints.

In the treatment of open joints, let it be ever remembered that upon no consideration must one be induced or tempted to remove the coagulation,

as it prevents the air from entering the cavity and causing irritation. If it is possible to stop up the wound at once, you should make it your endeavour to do so ; but if the case has gone on for a day or so, pus will be formed, and must have exit, so plugging will not do then. You must employ fomentations at the first, to be followed by the application of a smart blister, which is an invaluable remedy. In this case the blister acts in three ways ;—first, by producing swelling, which closes up the wound more or less ; second, by keeping the animal quiet ; third, by setting up the process of repair within the part.

During the progress of open joints, you will see little abscesses form, which burst and discharge synovia. Do not open these, but allow them to open of themselves. Long rest is generally required ere you succeed with those cases ; so the horse should be slung, and the best of food supplied him.

Burns and Scalds

are divided into three classes,—namely, burns producing redness, with loss of hair ; burns producing vesicles or blisters ; and burns producing sloughing or mortification of the parts. For those producing only a slight redness of the skin, paint on with a camel-hair pencil a solution of nitrate of silver, 5 grains to 1 ounce of water ; and after one coat has dried, put on another. Second, those attended by a greater degree of inflammation—producing vesicles in

abundance, which sometimes run on to obstinate ulcers—should be treated with lime-water and linseed-oil, or a solution of the nitrate of silver.

Constitutional Symptoms present.—The pulse weak; the animal shivers all over, blows, and is very much depressed. These must be overcome by giving stimulants, and opium to relieve the pain. In some cases, where you have an extensive burn with the skin destroyed, the parts slough to a great extent, leaving underneath a texture of a pale-yellowish colour, very difficult to heal.

Treatment.—Subdue the fever, by giving a laxative and aconite, then paint over the surface a solution of nitrate of silver. After a day or so the surrounding parts will swell, a line of demarcation will present itself between the healthy and unhealthy parts; and when pus is formed, you should foment the parts with warm water, and dress with oil and lime-water, or opium and oil. Afterwards, when the granulations become healthy, apply astringents.

Repair of Tissue.

The power of reproduction is certainly remarkable in the lower class of animals; but in the animals we have to deal with, this power is limited to three classes of tissues,—viz., first, those reproduced by nutrition and repetition, such as blood and epithelium; second, those of the lowest organisation and lowest chemical composition, such as gelatine, bones,

&c.; third, those inserted into other tissues, not, however, essential to their structure.

Epithelium, when stripped of the mucous membrane, is reproduced as well as in nerve fibres; but the other tissues are only liable to repair, their place being taken by a low form of organised tissue. Dr Hunter says: "When a wound has no external communication with the atmosphere, it rarely inflames, or only to a slight extent; but if exposed, it will both inflame and suppurate."

Healing of Wounds

takes place in four different ways,—namely, by primary adhesion, by granulation, by secondary adhesion, and by healing under a scab.

Dr Hunter again says, "That union by the first intention is caused by a fibrous exudate being thrown out, gluing the lips together and becoming organised, thus joining the parts."

Blood extravasated is, therefore, not without its influence on the healing of wounds, although it is not required for the healing by the first intention. Again, if blood is left in a wound, it is apt to produce inflammation; therefore it ought to be removed, as in some instances it becomes organised. The best time to remove a clot of blood is the second or third day.

The new material for repair is generally called coagulable lymph; and this lymph is composed of

fibrin, a little fatty matter, and a little saline constituents. It may be designated a living fluid, as it possesses vital powers to develop itself from inherent elements contained within, and is classified with fluids that have the property of assuming organised structure, which, as said before, exists in itself.

The principal material for the repair of wounds is lymph, which has a tendency to develop into fibrous or areolar tissue; but in some cases it deviates from this line, as in the case of fractures, when it may proceed at once to fibro-cartilage, which may become ossified. The lymph develops itself into areolar tissue from nucleated cells, these cells containing nucleoli, which are filled with granules. After a time they elongate. These processes are seen coming from the extremities, which form into a fibre—another and another cell going through the same process; and in this way fibrous tissue is developed.

Primary adhesion is accomplished in the following manner: When the divided edges are allowed to remain open till the mouths of the vessels are closed, inflammation is set up, lymph is thrown out, and the edges are united.

Granulation.—When a wound fails to heal by the first intention, it then heals by granulation. Blood gradually ceases to flow from the wound; a whitish film is collected over the surface, which is found to contain a number of corpuscles, and these become adhesive. If the wound remains open, the fibrin

collects, while there is in and about it a period of inaction, the blood during that time being stagnant or nearly so ; hence materials cannot be given off for repair. Again, in healthy repair, the blood is rapid in its circulation ; but in healing by pus, it is greatly retarded or stagnant altogether.

Simple granulations are generally colourless ; but granulations of three or four days' standing are moist, florid, and smooth, and these form the connective tissue that supplies the part of the muscular tissue destroyed, mixed with a few fibres of elastic tissue. Again, granulations are sometimes arrested in their development : in those cases months may elapse and the cells not develop. Again, in other cases the cells not only do not develop themselves, but they degenerate, acquiring more the structure of pus-cells ; and it is in this condition they are found in the walls of sinuses, &c., or they may lose all structure, and degenerate into a mass of molecular substances.

Fungus, or proud flesh, is granulations tinged with blood. Granulations, again, may become inflamed, and purulent matter pervade the whole mass,—all these retard the healing process.

In wounds the pus serves as a cover for them, so if it be thick and creamy it should not be washed off, and when a wound heals it has the power of contraction, at least the scab over it has. In granulation new blood-vessels form themselves : at first you will observe a bulging out of the side of a

neighbouring capillary, which prolongs itself to meet the same process of its neighbour, and as their blind ends meet they become absorbed, so in this manner blood-vessels are supplied. Sometimes these bulgings burst and discharge their contents, the red corpuscles ; but these arrange themselves in one direction to meet the other dilatation on the opposite side, and at last are covered by a film which acts as a coat.

Secondary adhesion.—This occurs whenever surfaces of wounds are well developed, but not covered by cuticle, and they are brought together.

In applying measures to produce this method of healing, certain circumstances are necessary, such as healthy granulations, &c. Healing under a scab is the most natural one, and requires no art whatever, and is termed cicatrix. The scales are formed from the fluid that exudes, therefore it has its advantages over all others ; but it is necessary to watch that no morbid exudation takes place under the scab,—if so, you must remove it, but on no other account remove a scab. When a wound is nearly healed the scar contracts, and is bound firmly to the skin, but in old wounds the scar may be freely moved like the skin itself.

FRACTURES OF BONE.

First, of the bones of the head. The jaw may be split from a fall, extending from the middle incisor to the neck of the bone, when the teeth will be

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FRACTURES OF BONE.

First, of the bones of the head. The jaw may be split from a fall, extending from the middle incisor to the neck of the bone, when the teeth will be

loosened, with more or less bleeding. Should the skin be cut it is termed compound, if not cut, simple fracture. If the bone is shattered into many pieces it is then called comminuted, and should the soft structure be wounded as well, it is then termed compound comminuted.

Treatment.—Remove the loose teeth, if any, and any pieces of bone that can be felt; and if the wound be too small to allow this, enlarge it so that you can make a proper examination. The jaw must then be brought together and bandaged tightly, to prevent any friction; then give a dose of physic, which will nauseate the animal and prevent him eating, as well as tend to keep down fever. The nourishment given afterwards must be composed of the best food, given in such a sloppy condition that the patient may drink or sip it, such as milk, bran, and linseed gruels, oatmeal gruels, &c. Under close care and attention there is nothing to prevent recovery.

In compound fracture you may find a dark fetid discharge from the wound, and in a case of this kind you will require to inject a disinfectant, such as a solution of carbolic acid. If the edges of the bone are found to be carious, destroy this by injecting a solution of acid hydrochloric, 1 to 20.

When the jaw is fractured, with displacement, you must get the parts into position; then stuff in tow bandages between the submaxillary space.

Over this and surrounding the face a bandage must be applied, then a strap over this again to prevent movement. The mouth, of course, must be kept closed ; milk, however, can be given to support the patient.

For after treatment apply soothing remedies : the solution of opium ; bathe frequently with warm water, and if fever sets in give aconite. Should there be occasion to extract the teeth, the hollows are apt to become filled with food ; so you must keep them clean by syringing with water after each meal. In old horses the healing process is very slow, and it should therefore be considered whether or not the animal is worth the expense.

Again, little pieces of bone will be found broken by the curb-chain, due to the cruelty of some drivers, or there may be thickening from the pressure of the curb, causing death of the part.

Treatment.—Cut down and remove the affected parts, if the bone be fractured. But if there be only thickening and the skin not cut, apply some *Ung. hydrarg. beniod.*, to reduce the swelling.

Or you may sometimes find the tooth fractured at the corner incisor, and a small piece of bone sticking up. This is done by horse-dealers to make the animal look older than he is. Remove the piece of bone, and fill up the cavity with gutta-percha, and keep the opposing tooth on a level by filing it occasionally.

You may also have fracture of the nasal bone. Sometimes this occurs high up, with depression, lessening the calibre of the nasal cavity, and causing the horse to roar when breathing. In a case of this kind you must raise the depression by means of a lever, or remove the offending bone, keeping the cavity clean, and watching for any inflammatory symptom.

Then, again, a horse may fall and fracture the orbital process of the frontal bone, causing total closure of the eyelids. There may or may not be a wound; if not, you must make one right over the arch, then insert your lever, and endeavour to raise the parts, and as you do so the eyelids will gradually open. If the bone is fractured into many pieces, clean and remove them, and then treat as a simple wound.

Fractures of the bones of the neck, back, pelvis, and limbs, are, as a rule, attended with fatal consequences. In such cases there is generally little difficulty in arriving at a correct conclusion as to the seat and cause of the lameness, or to the inability of the animal to move; for the evidences presented soon leave little room for doubt but that the animal has a broken back or a broken leg, as the case may be,—therefore to enter into a description of these is scarcely necessary. All that is required is to be convinced that such is the case, ere you order the animal to be destroyed.

DISEASES OF THE EYE.

Gutta Serena.

In this disease the pupil becomes round, dilated, fixed, and insensible to light. In health, when the eye is exposed to a strong light, it contracts, and in a mild light it dilates; but in this complaint the eye is brighter than usual. It may attack one or both eyes, and may be partial or complete; when partial the animal will shy, and show by the irregular contraction of the eye that his vision is at fault or defective.

Causes.—Error in feeding, stomach-staggers, milk-fever. As a rule, it is incurable; but if arising from error in feeding, remove the cause, and the effect will cease. Apply hot fomentations, give a dose of physic, and blister the cheek, &c.; but if there is no change for the better from this treatment, you may abandon all hope.

Simple Ophthalmia

may be caused by a blow or common cold, or by any irritant to the eye—such as blistering, when he will rub the side of his face and eye over the blistered part: this produces irritation and redness of the organ, therefore it should not be mistaken for disease.

Symptoms.—Partial closing and swelling of the eyelids, increased secretion of tears, flowing down the cheeks and corroding the skin, with a kind of blue scum spreading over the whole extent of the eye.

Treatment.—Apply hot fomentations, and when the swelling is very great scarify the eyelids. Give also a dose of physic, provided the animal is not suffering from cold; applying likewise a weak solution of Goulard's Extract, 1 ounce; tincture of opium, 1 ounce; water, 1 pint; and keep the animal in a dark place.

There are many other diseases that the eye is liable to, into the respective symptoms and appearances of which it would perhaps be of little avail to enter; for in such cases the help of a professional man is required, in order to advise the best course to adopt. These comprise cataracts, melanosis, fungus, hæmatodes, worms in the eye, tumours, &c.—all of which require watchful care in their treatment, owing to the extreme delicacy of the organ affected.

Having now given an account of the diseases that are ordinarily met with in the horse, little remains to be said, further than to embrace the present opportunity of informing the public that a companion work on the diseases affecting sheep and cattle, with treatment, will be issued shortly.

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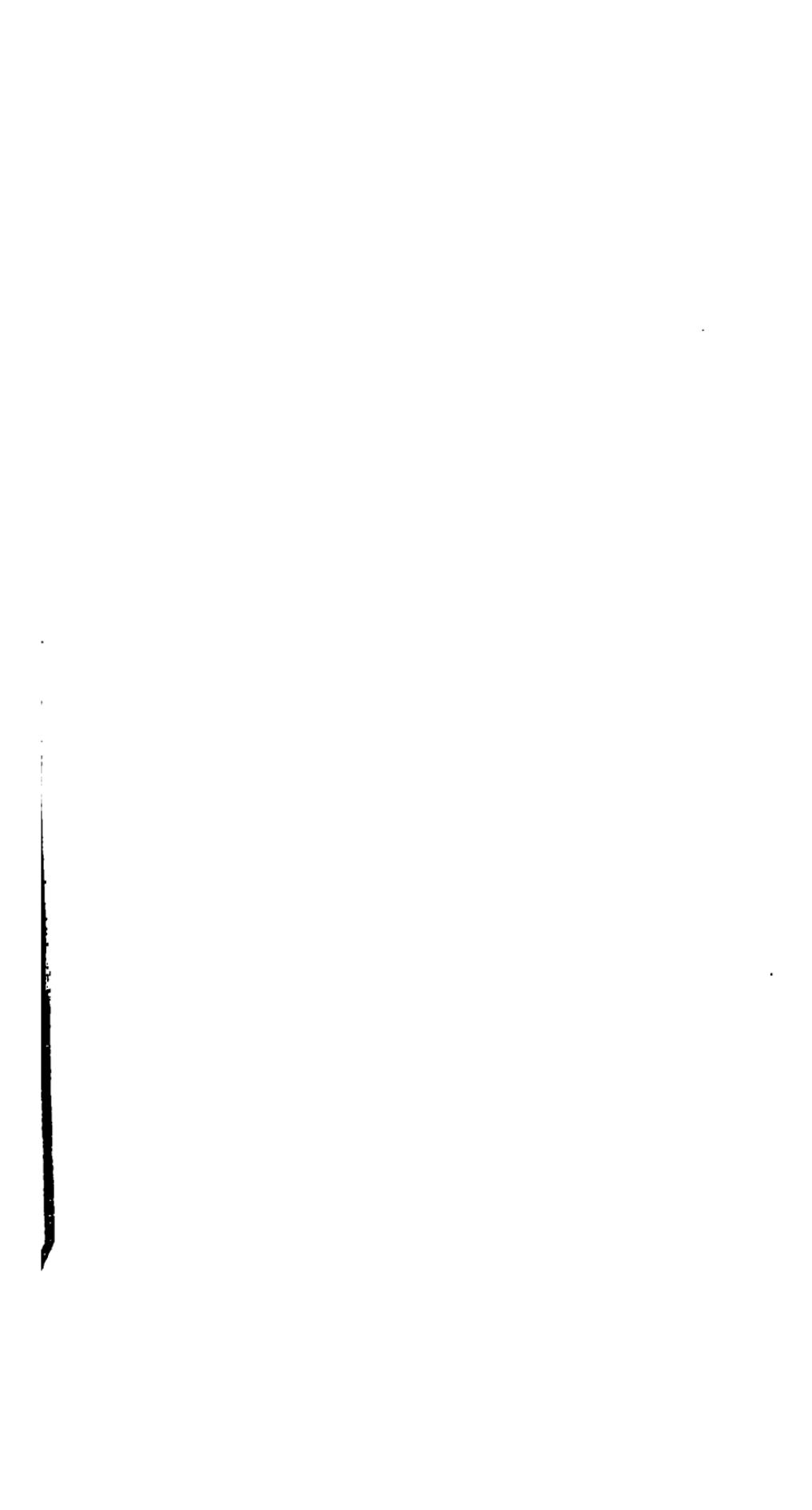
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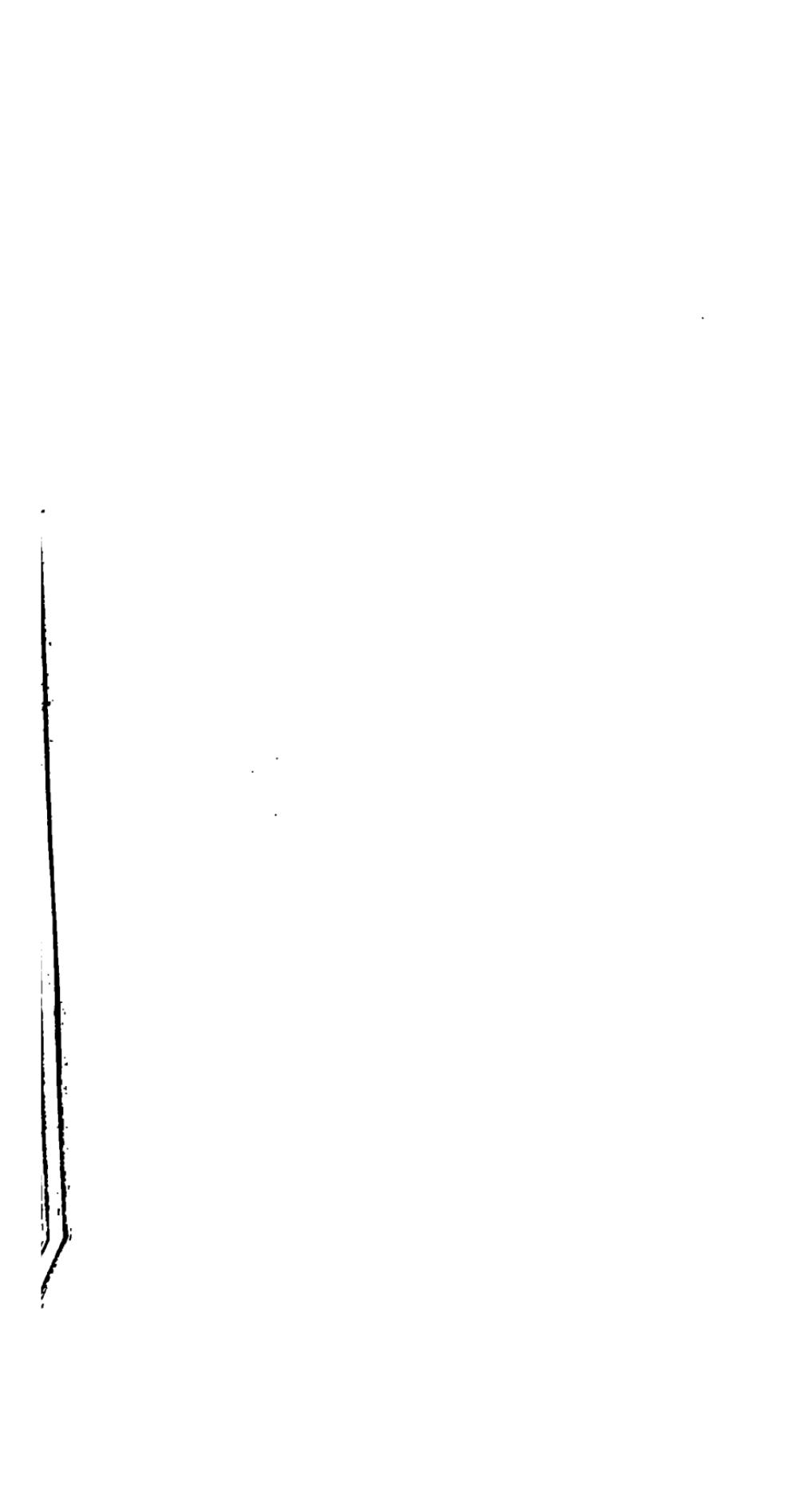
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